

Figure 1 Conventional Noise Feedback Coding

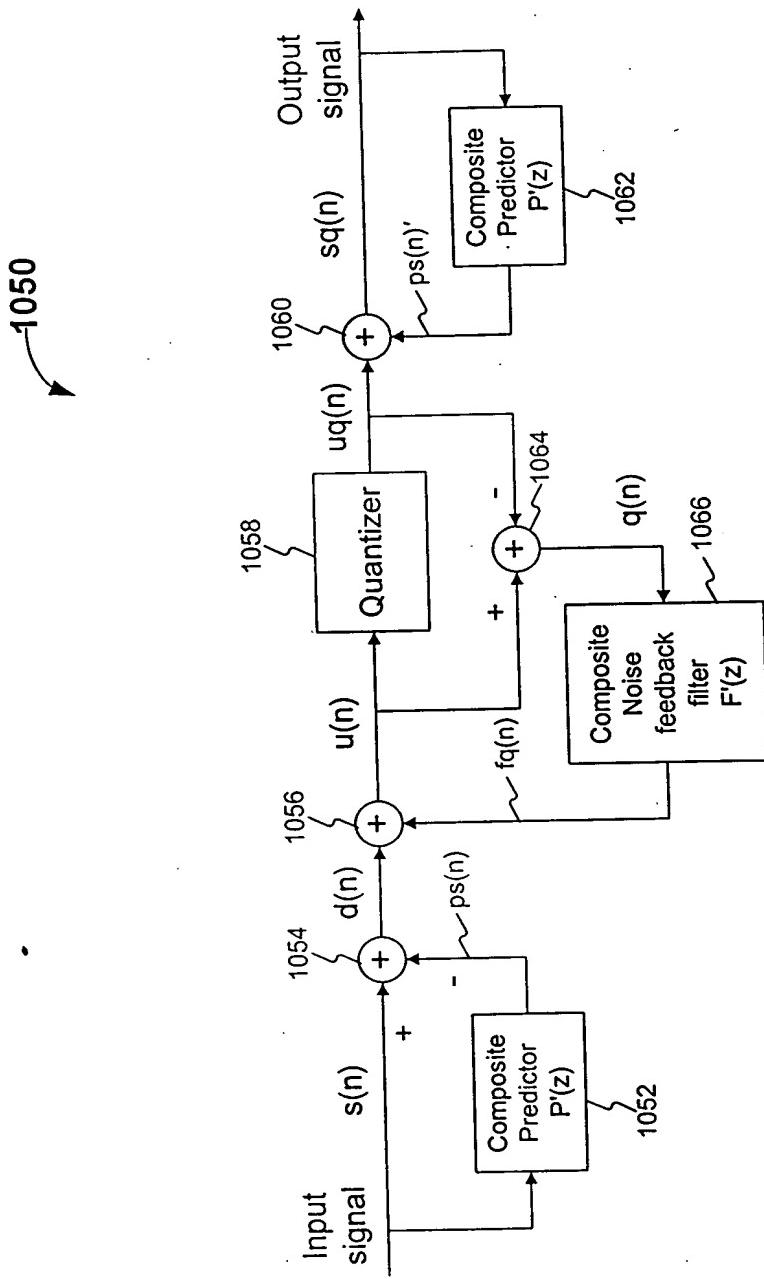


Figure 1A Noise Feedback Coding Using Composite Short-Term and Long-Term Predictors and Composite Short-Term and Long-Term Filter

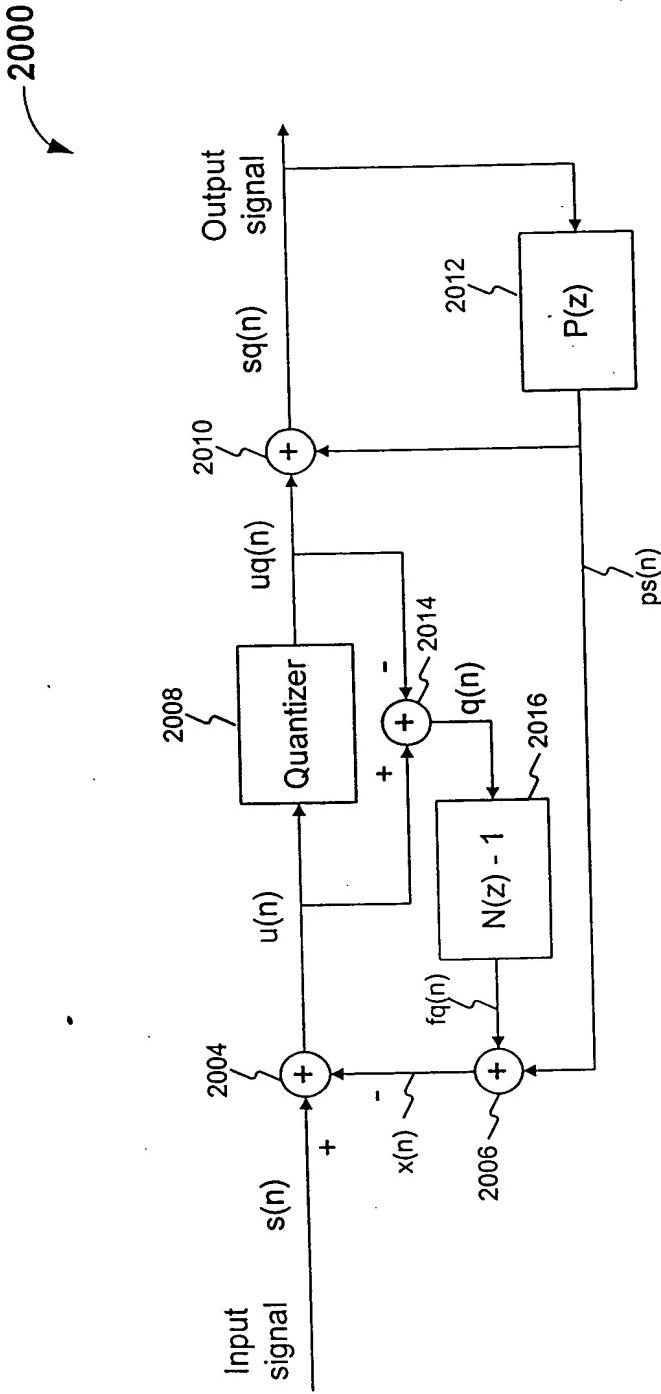


Figure 2 An alternative form of conventional Noise Feedback Coding

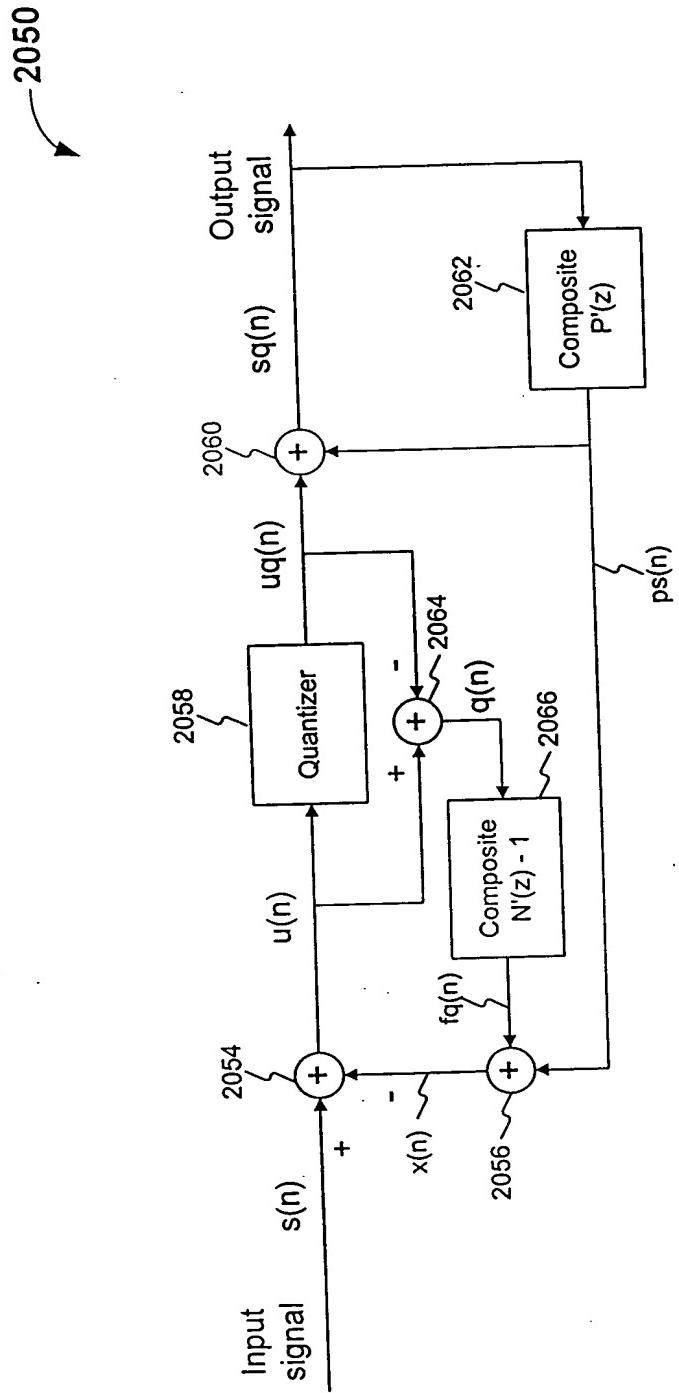


Figure 2A Noise Feedback Coding Using Composite Predictor and  
Composite Noise Filter

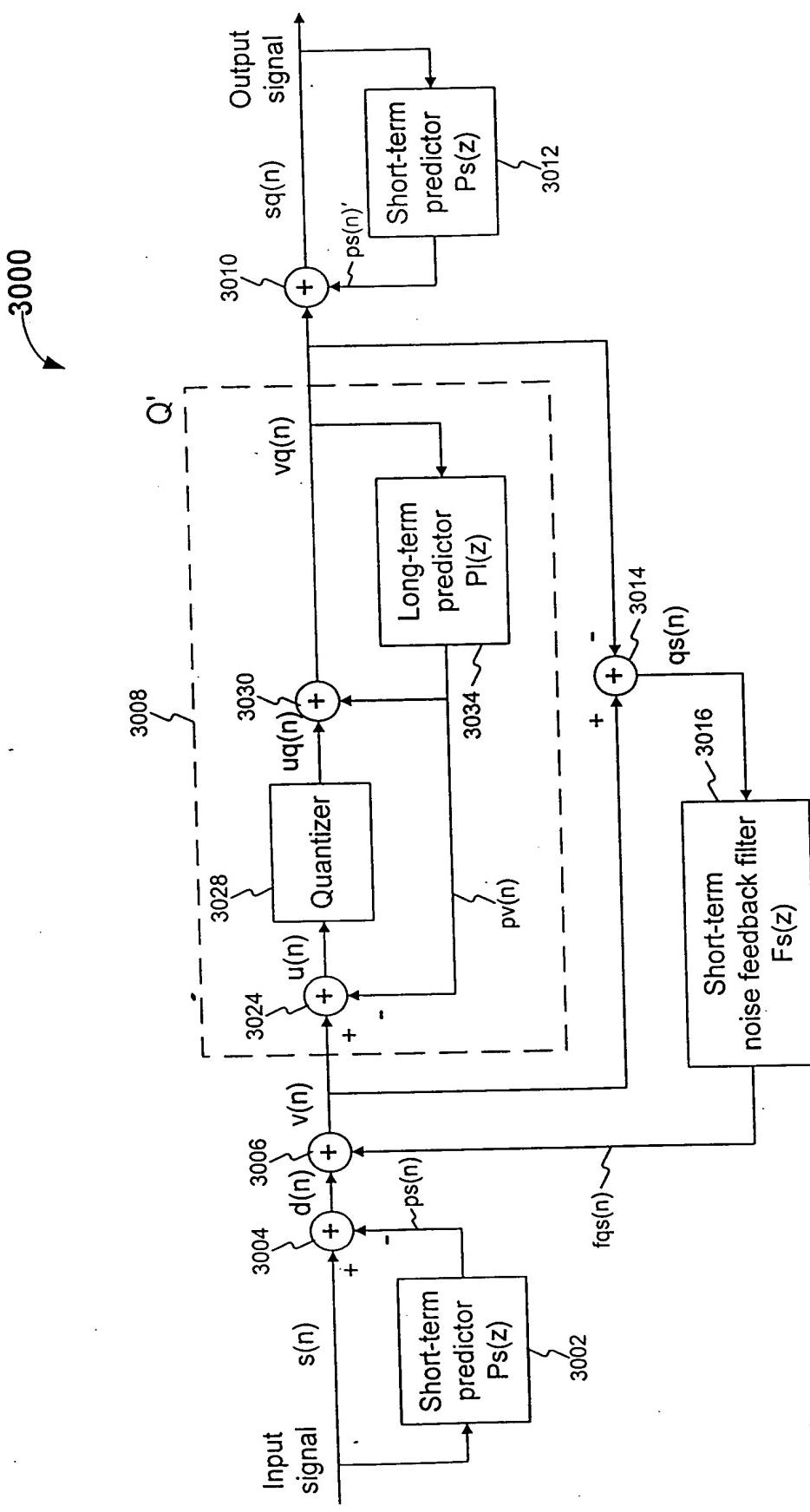


Figure 3 Noise Feedback Coding with short-term and long-term prediction but only short-term noise spectral shaping

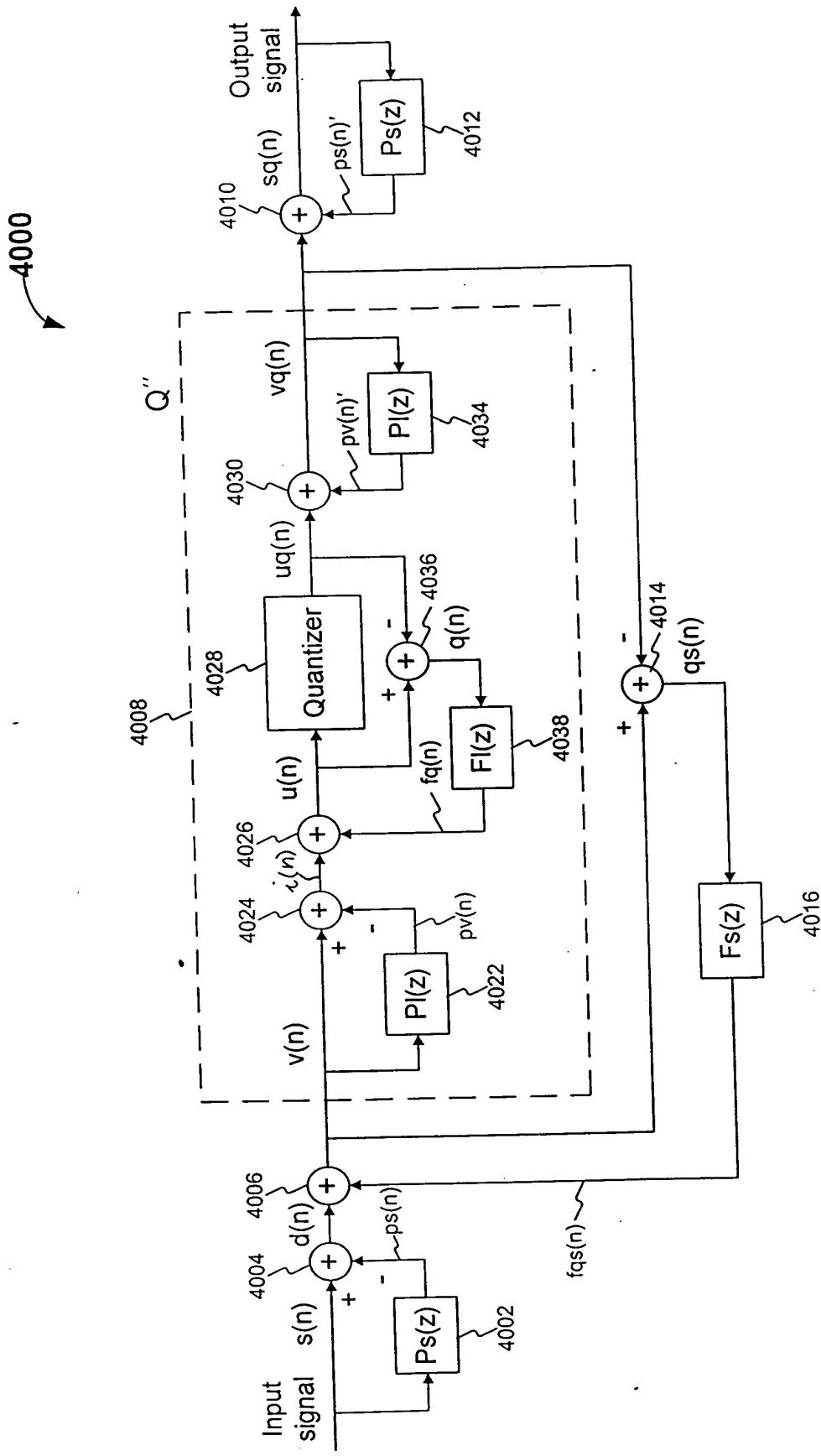


Figure 4 Nested two-stage Noise Feedback Coding structure with short-term and long-term prediction and short-term and long-term noise spectral shaping

5000

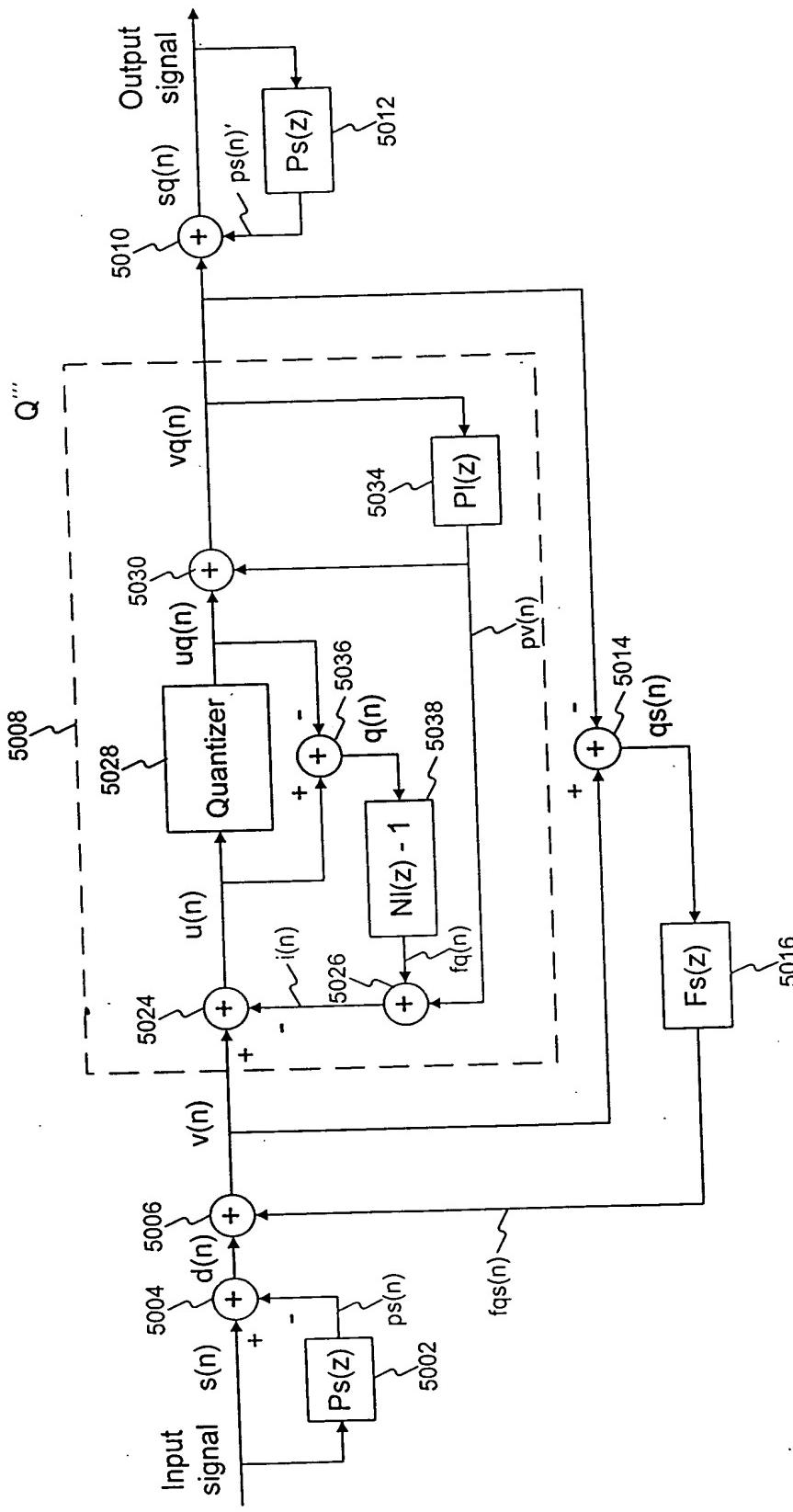
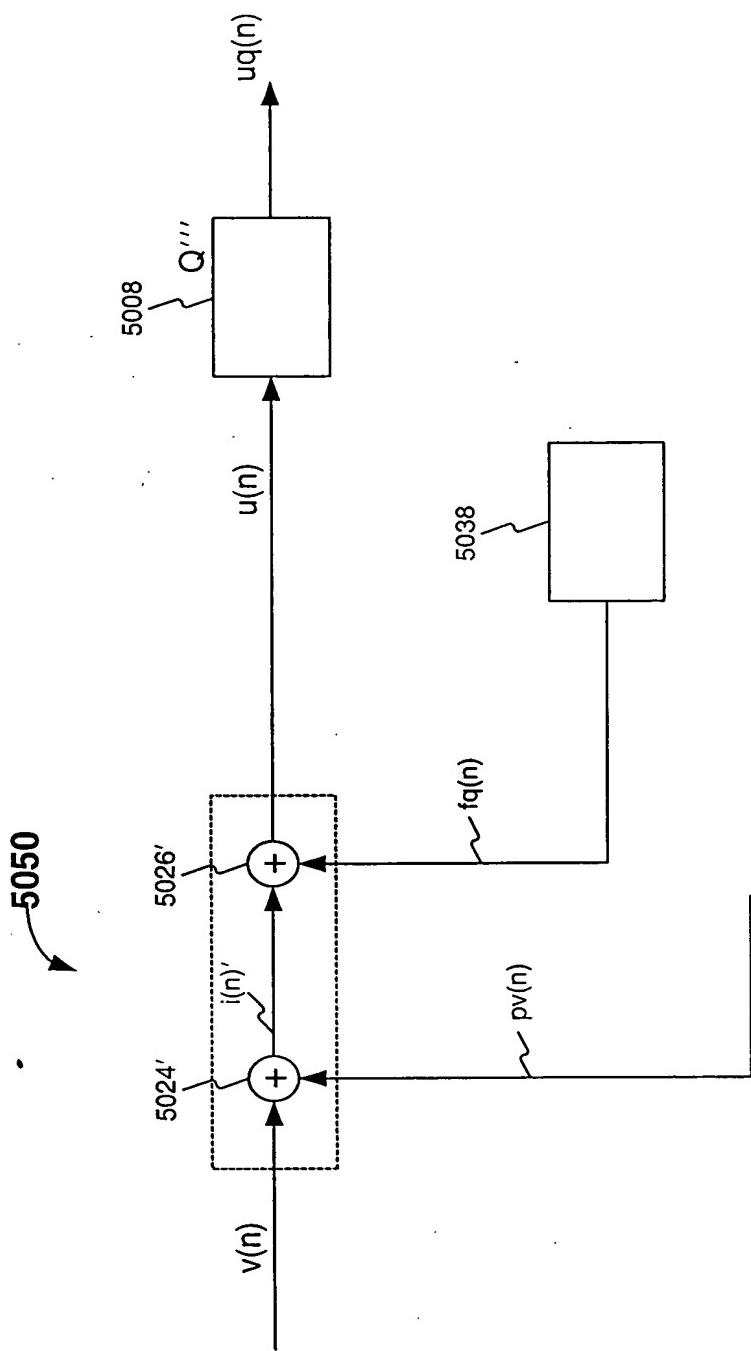


Figure 5 An alternative nested two-stage Noise Feedback Coding structure with short-term and long-term prediction and short-term and long-term noise spectral shaping

FIG. 5A



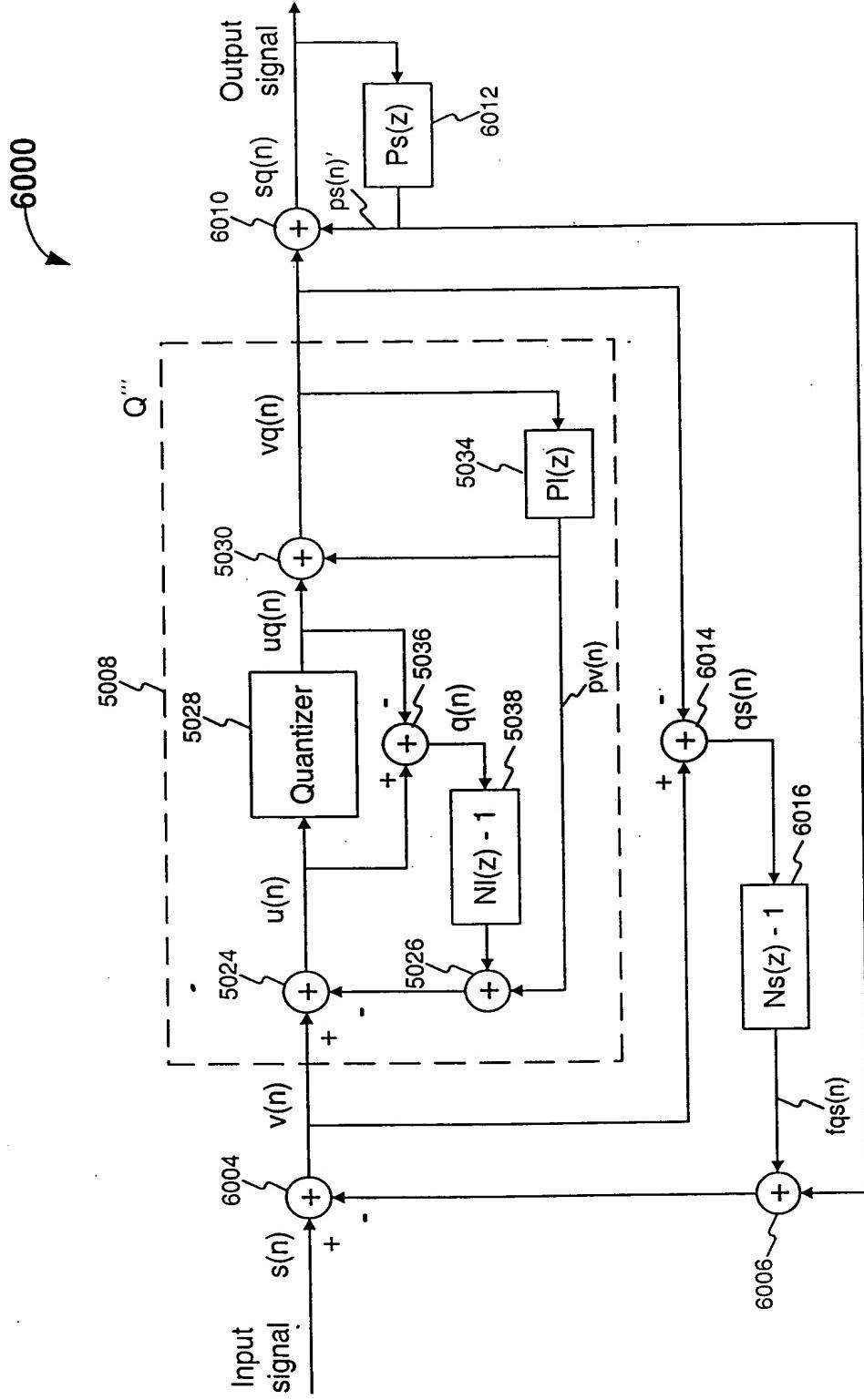
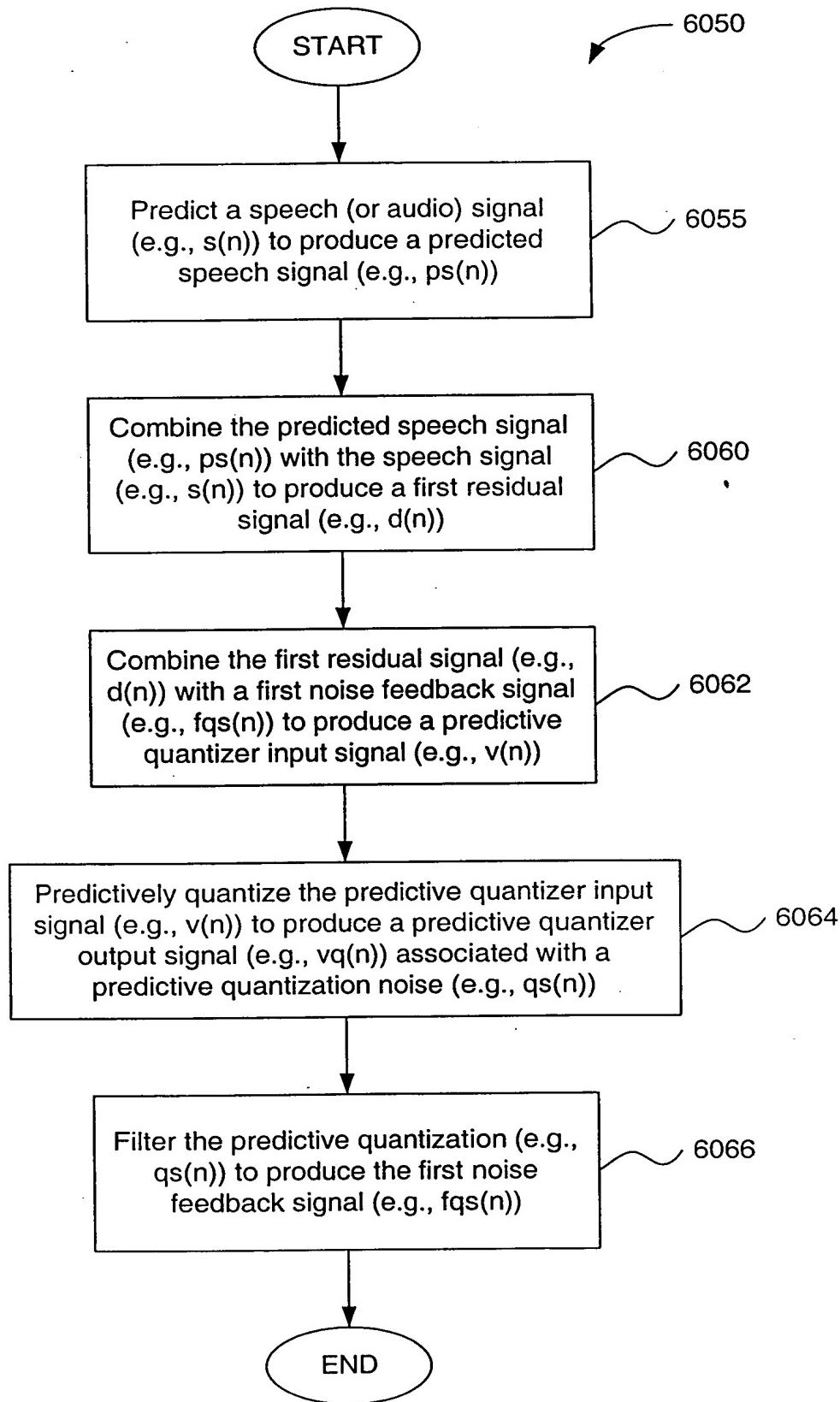
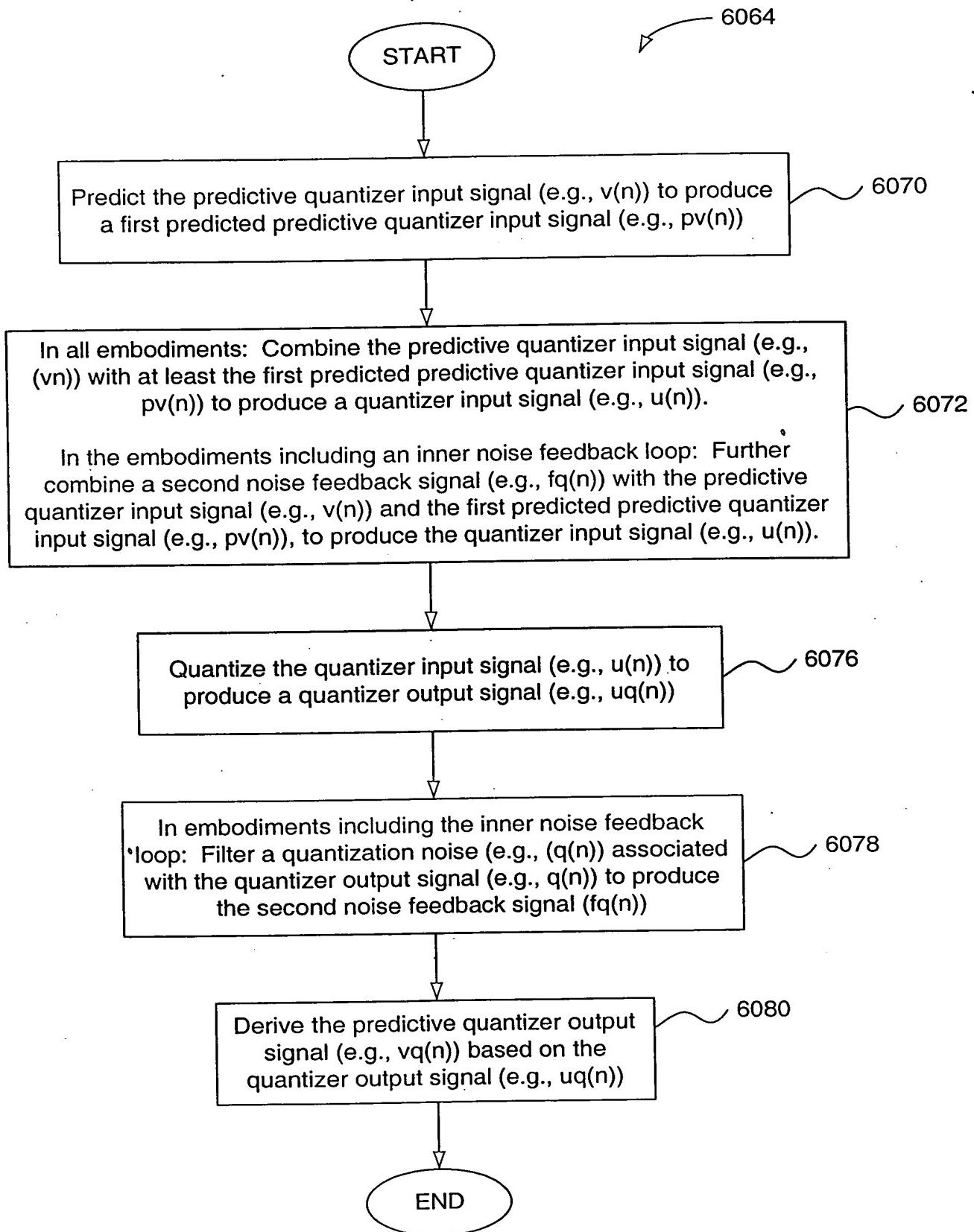


Figure 6 Another alternative nested two-stage Noise Feedback Coding structure with short-term and long-term prediction and short-term and long-term noise spectral shaping



**FIG. 6A**



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7000

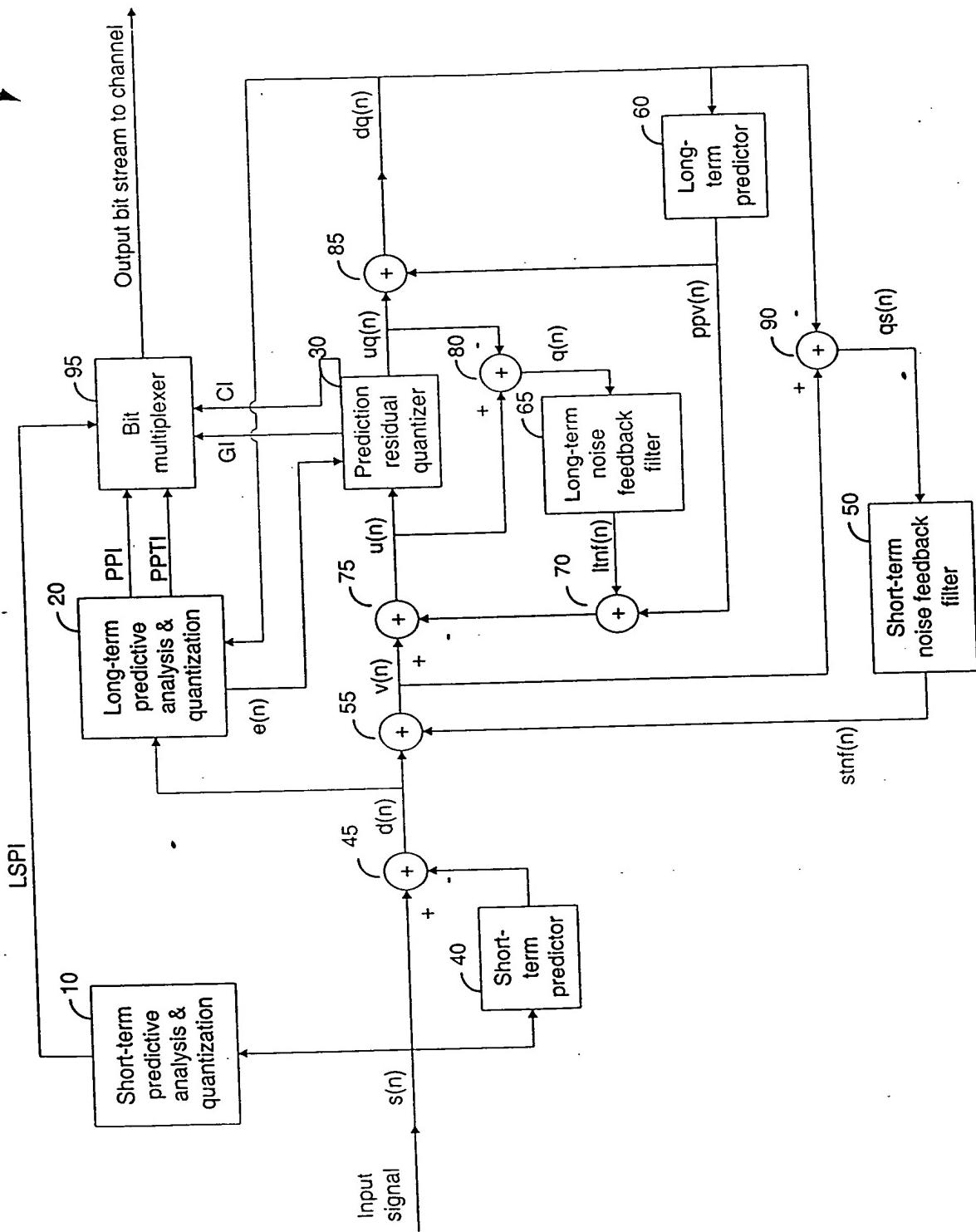


Figure 7 Encoder of a nested two-stage noise feedback codec (TSNFC)

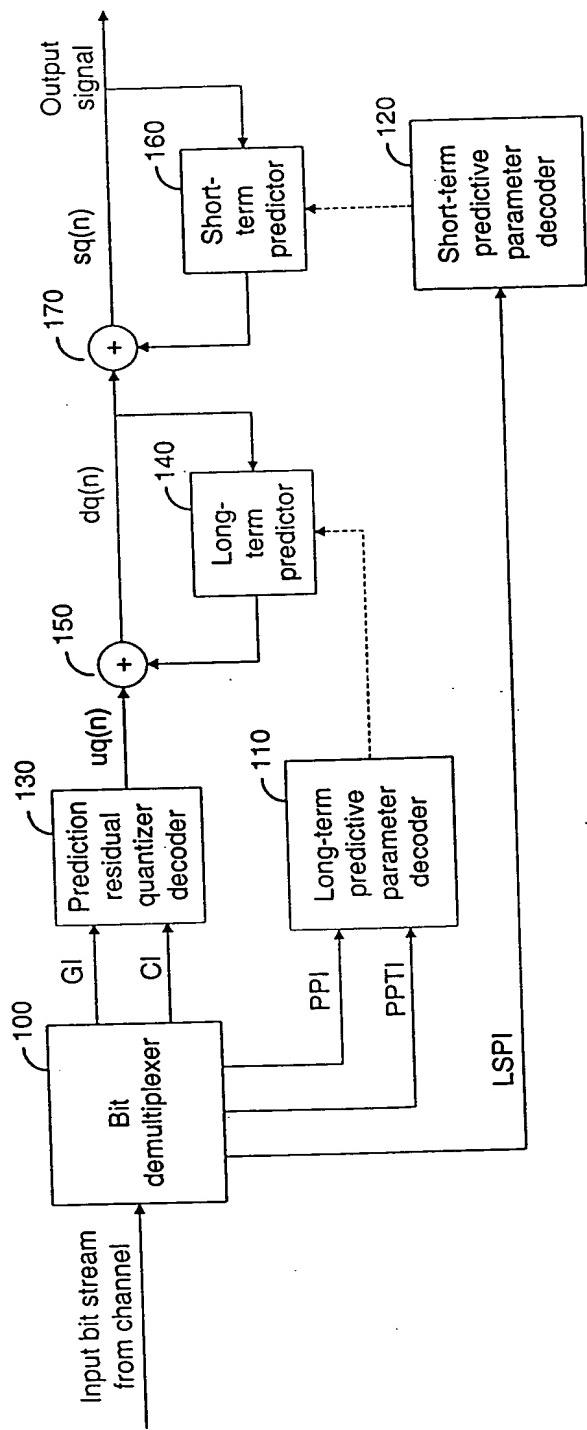


Figure 8 Decoder corresponding to the TSNFC encoder in Fig. 7

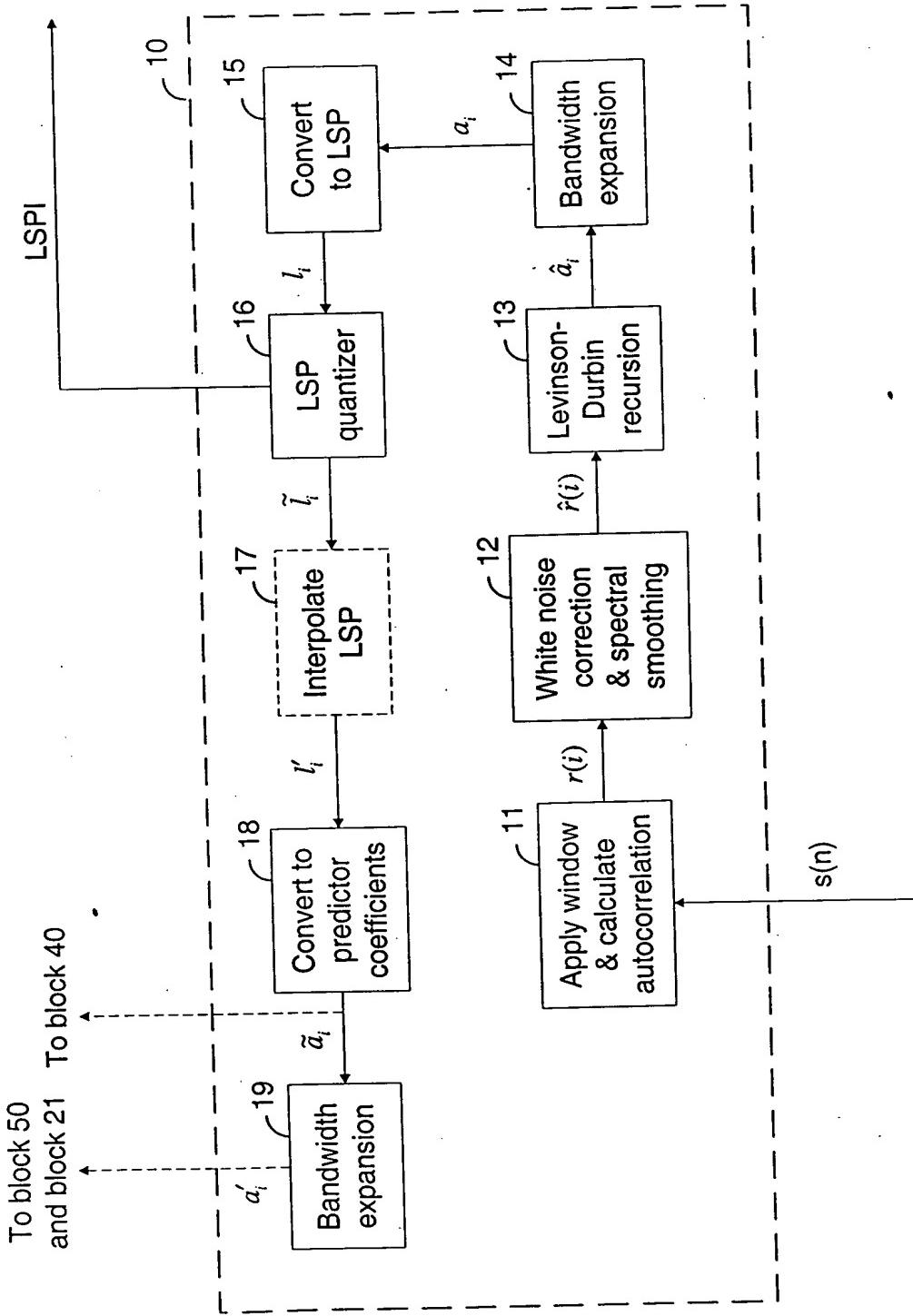


Figure 9 Short-term predictive analysis and quantization (block 10)

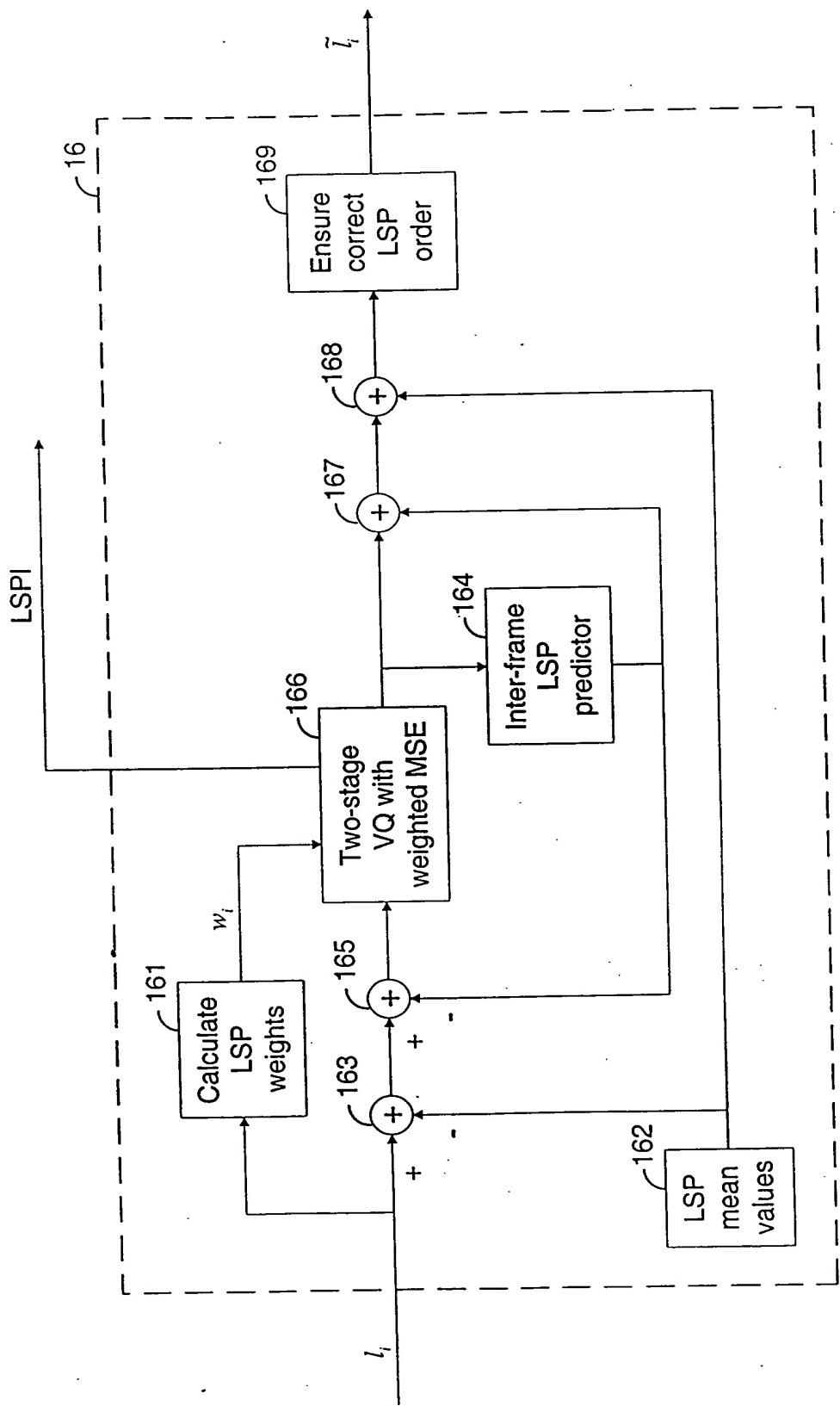


Figure 10 LSP quantizer (block 16)

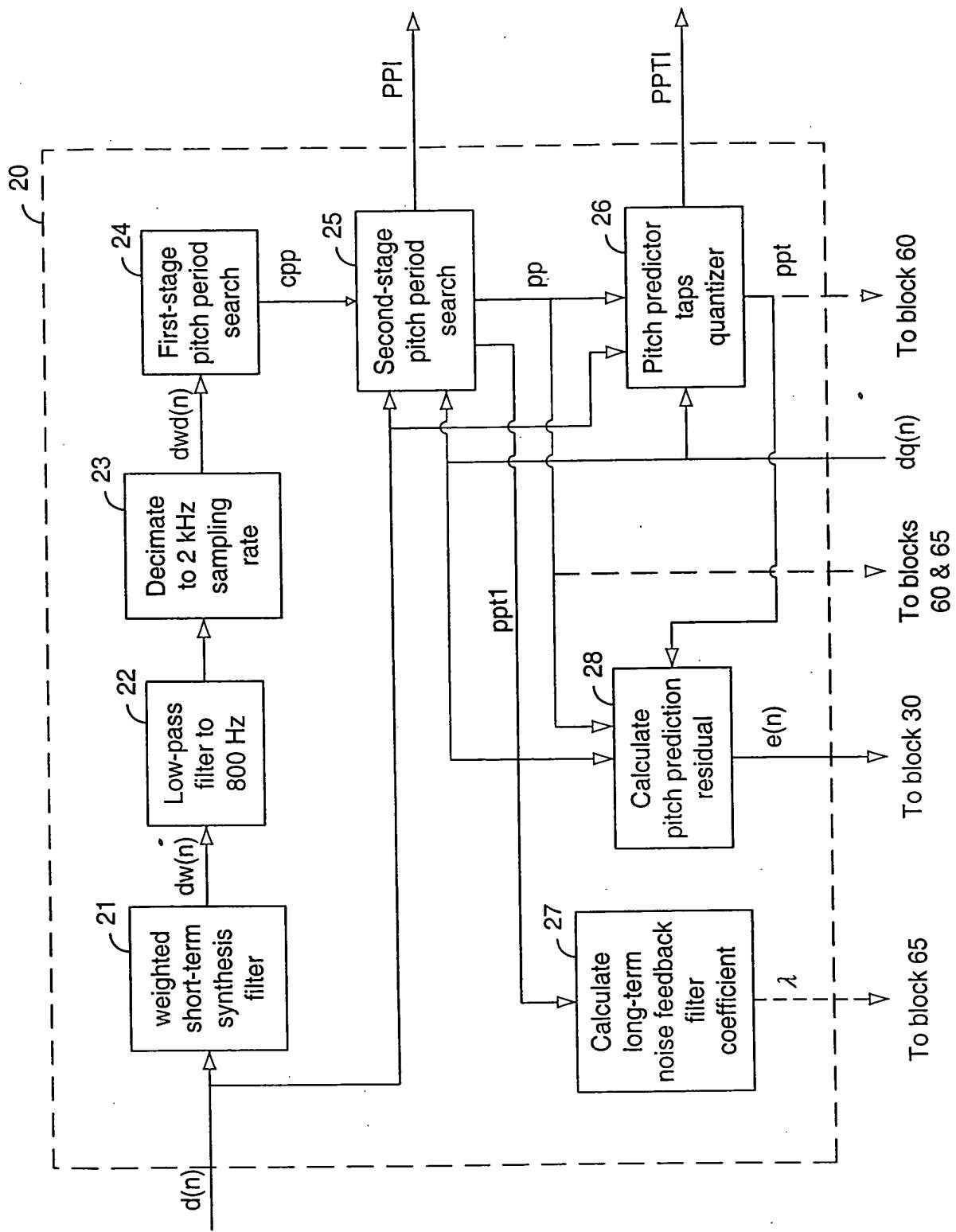


Figure 11 Long-term predictive analysis and quantization (block 20)

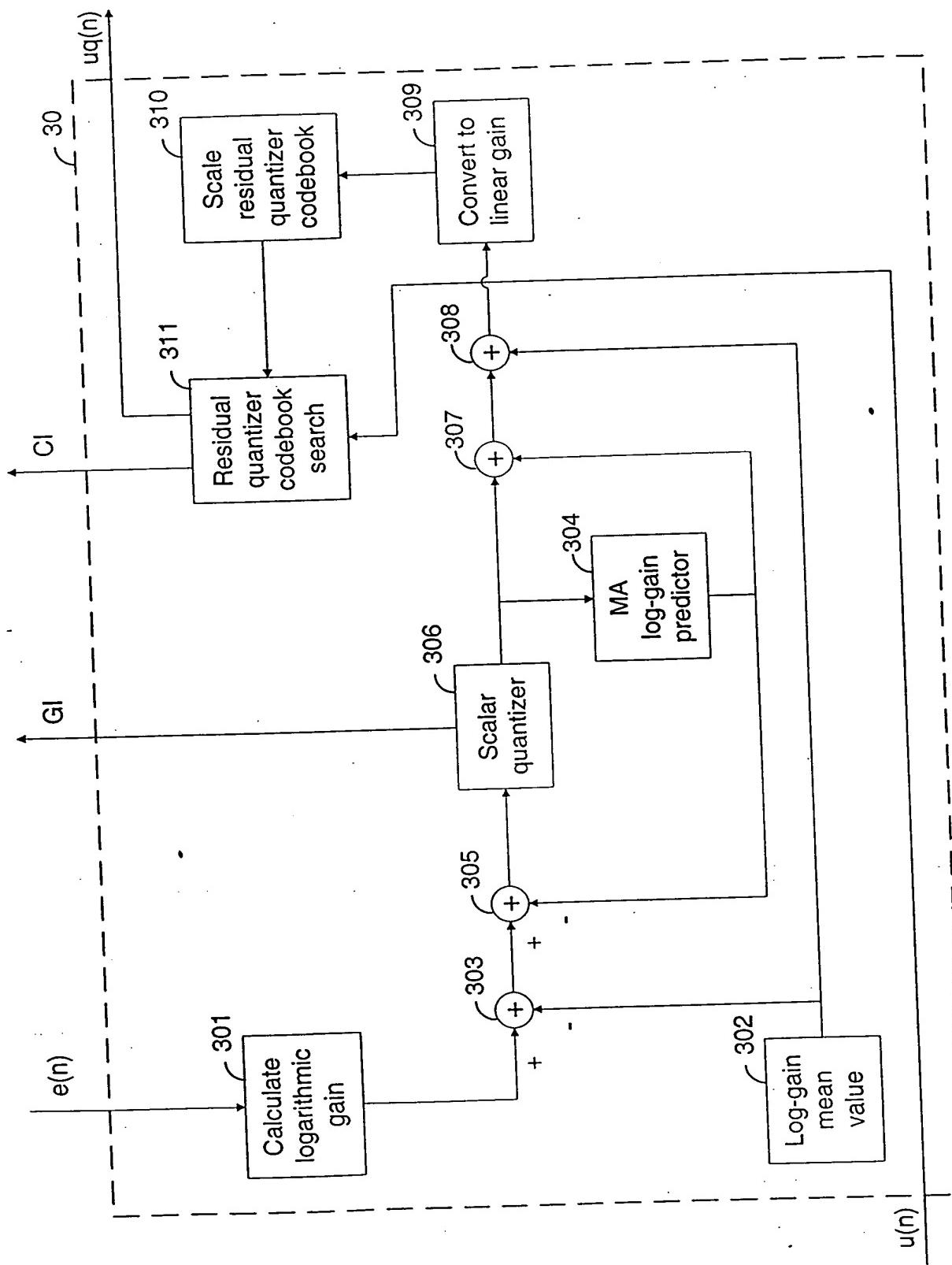


Figure 12 Prediction residual quantizer (block 30)

1300

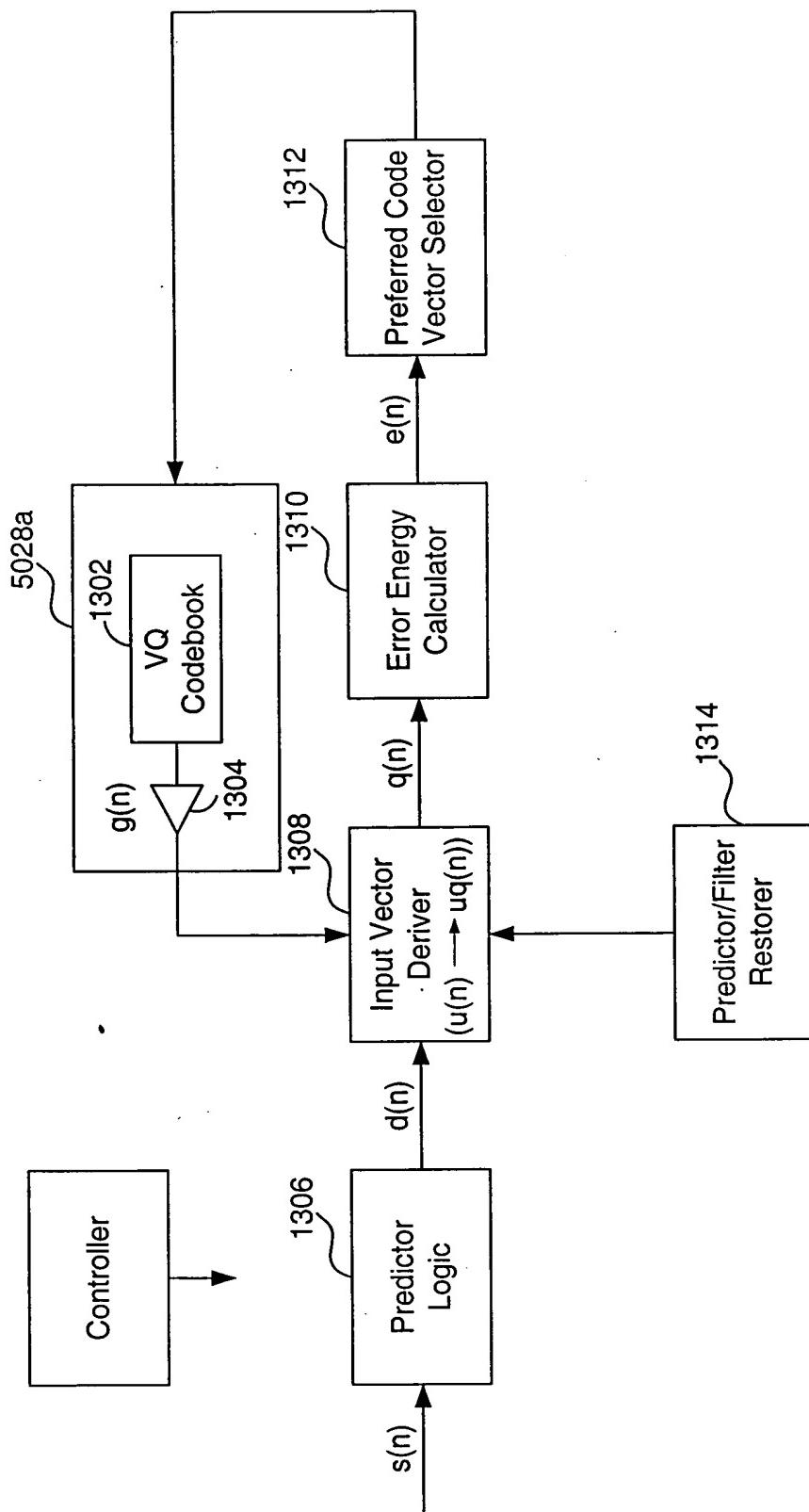
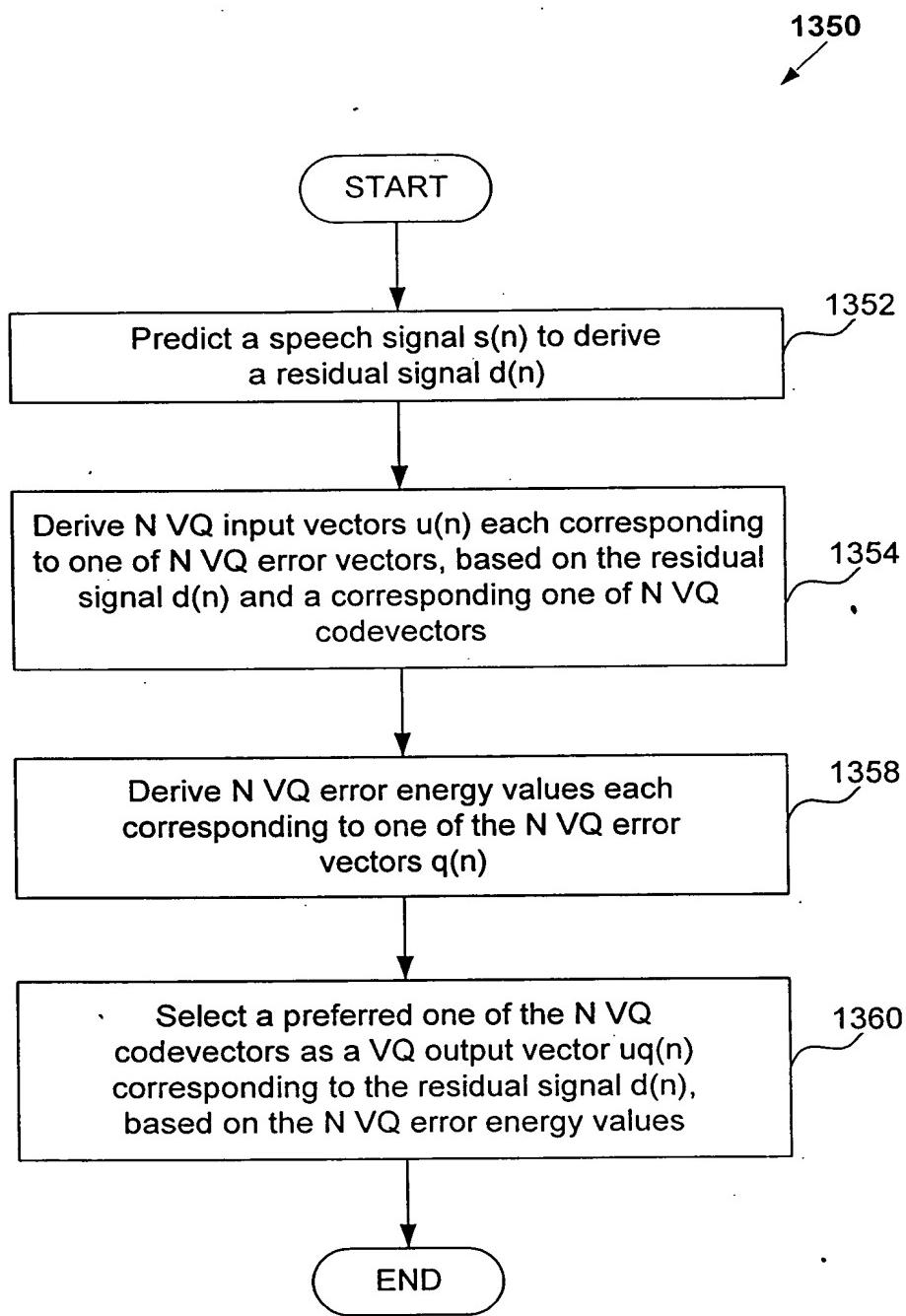
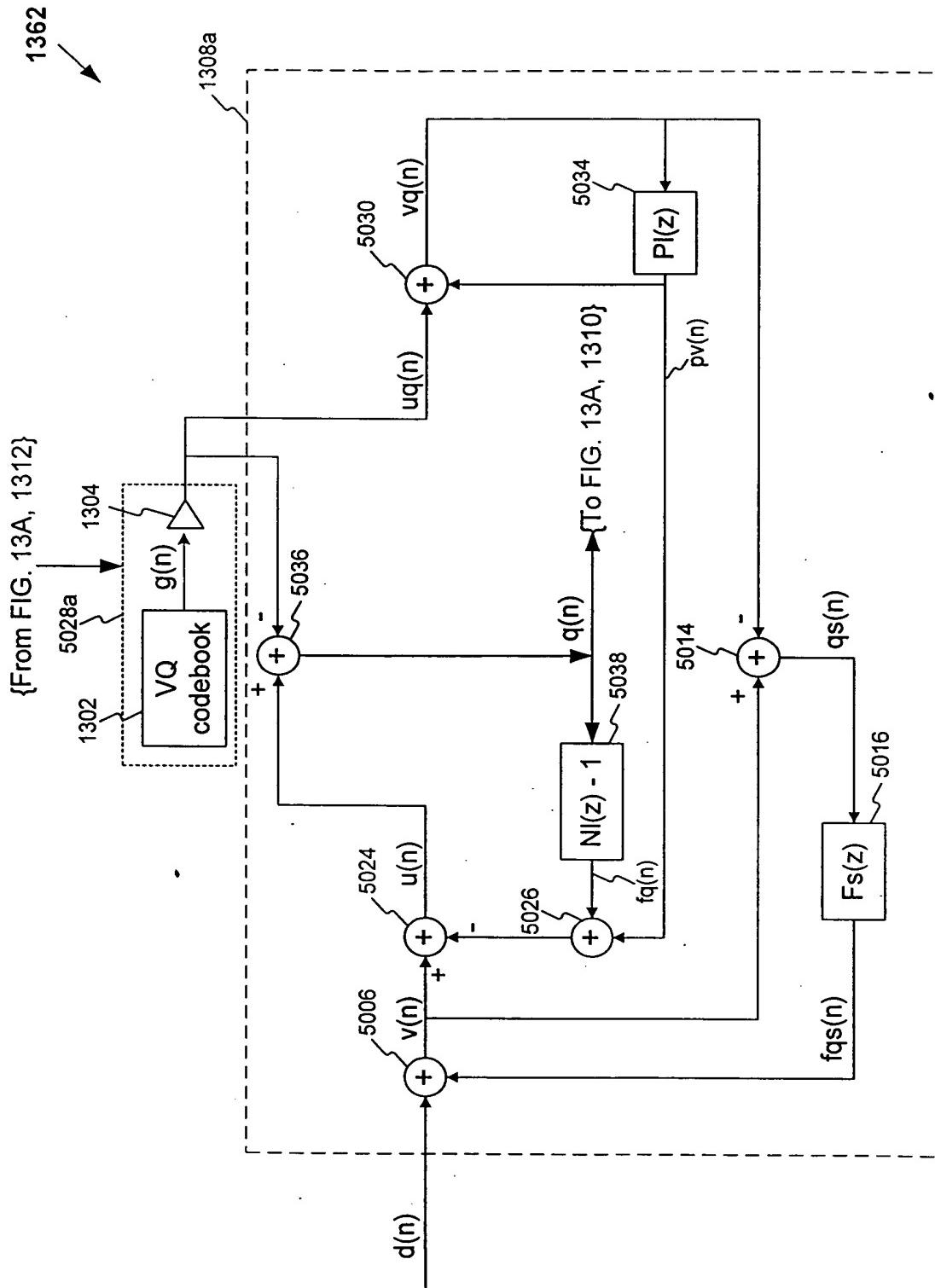


FIG. 13A

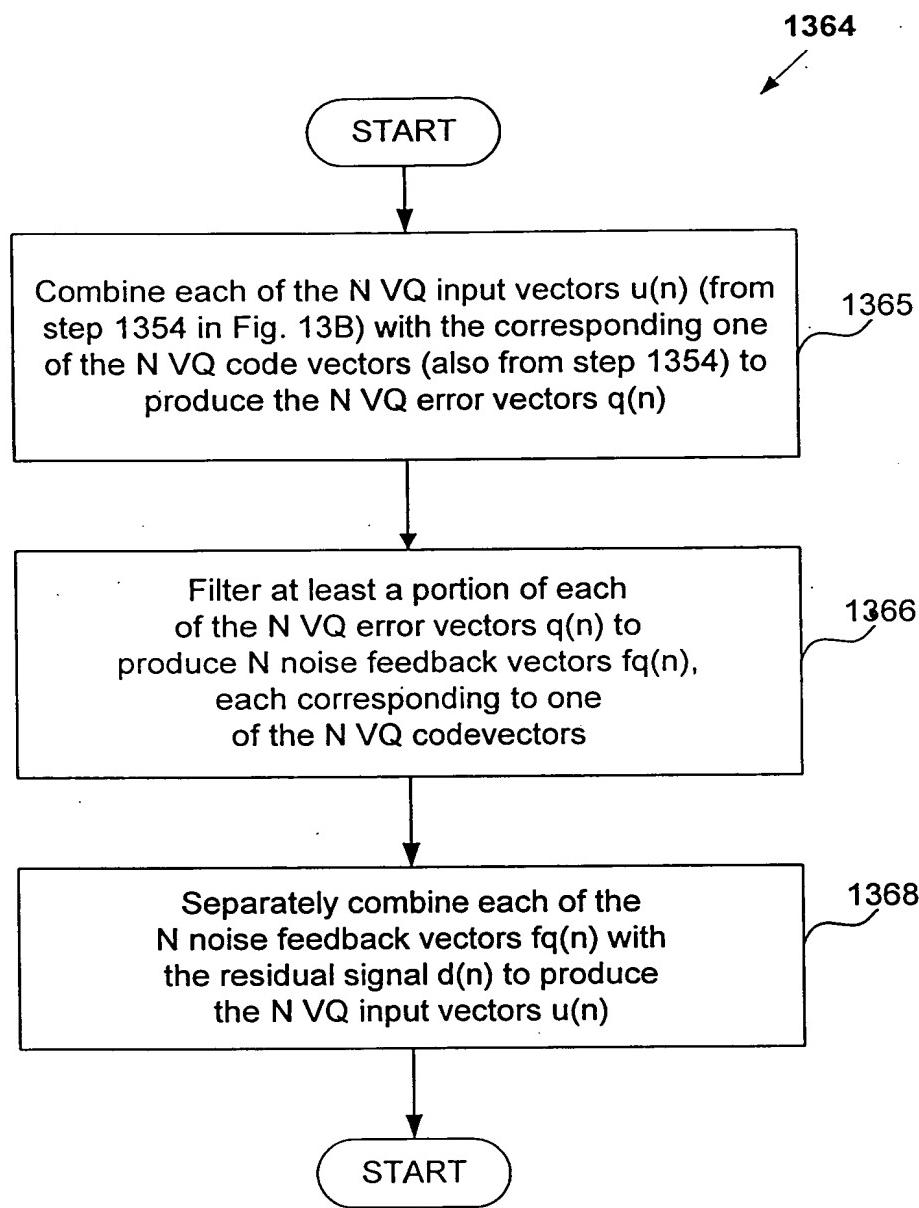


**FIG. 13B**

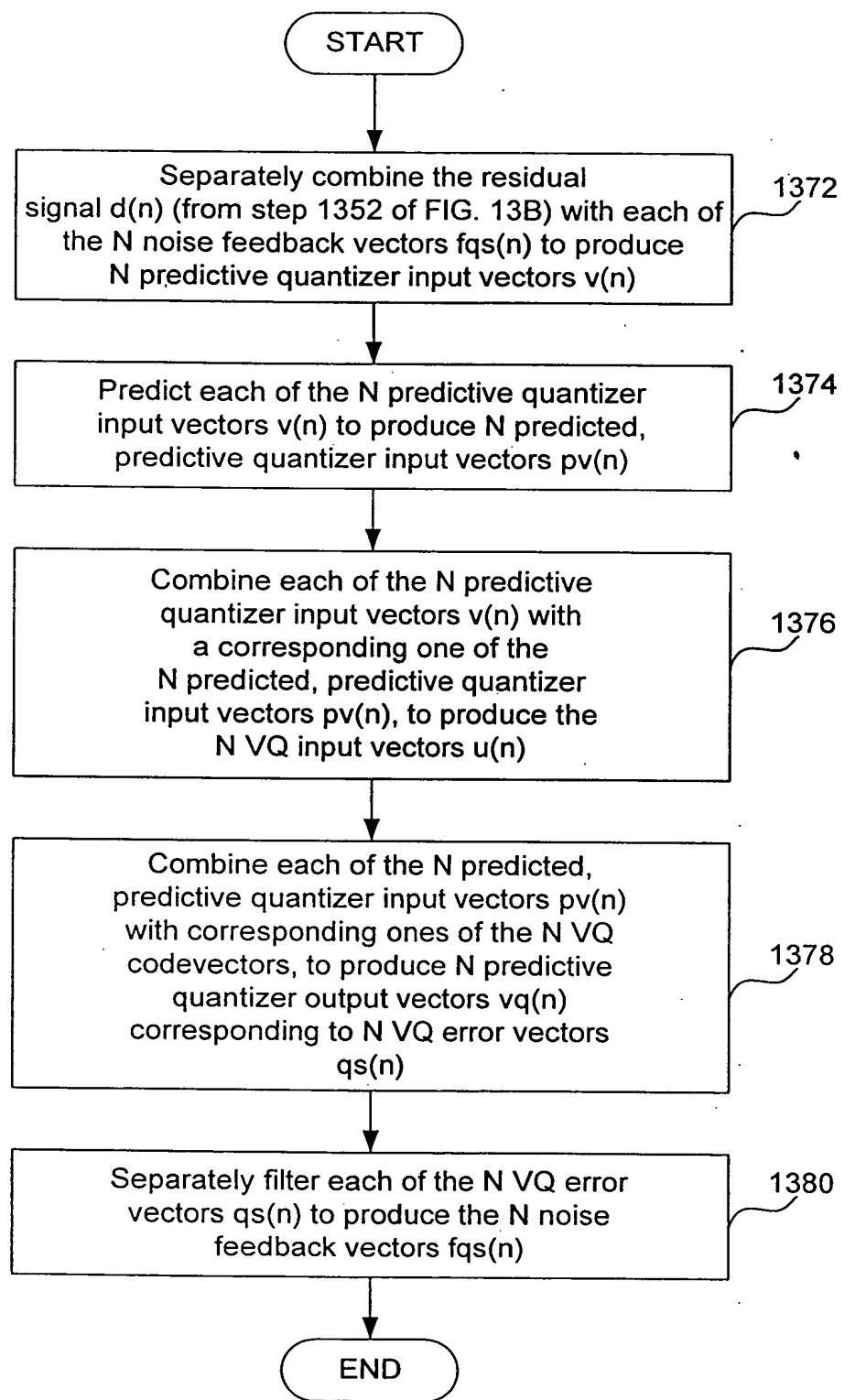
FIG. 13C



The portion of the codec structure that is used in prediction residual VQ codebook search of the two-stage noise feedback codec of Fig. 5.

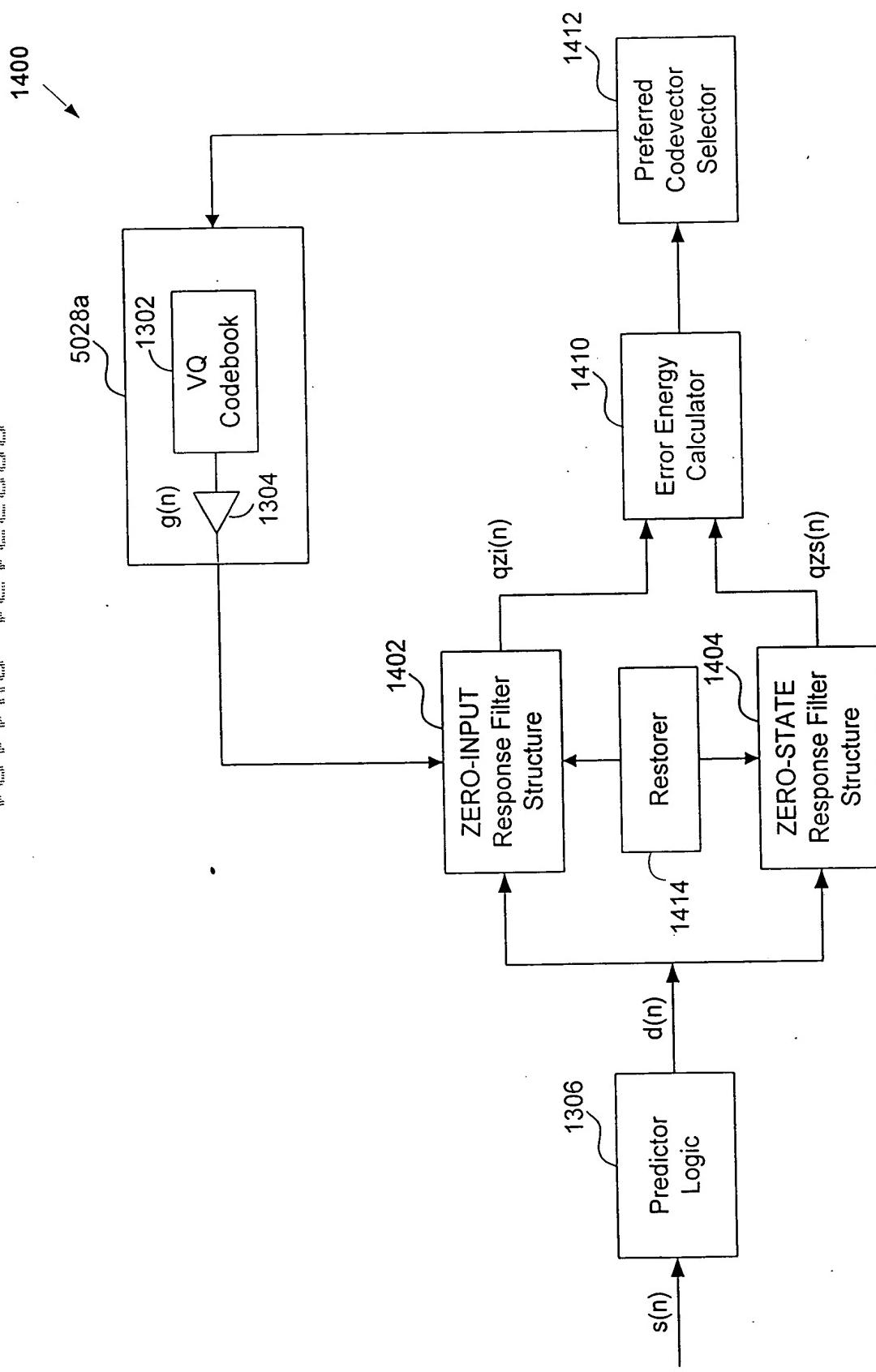


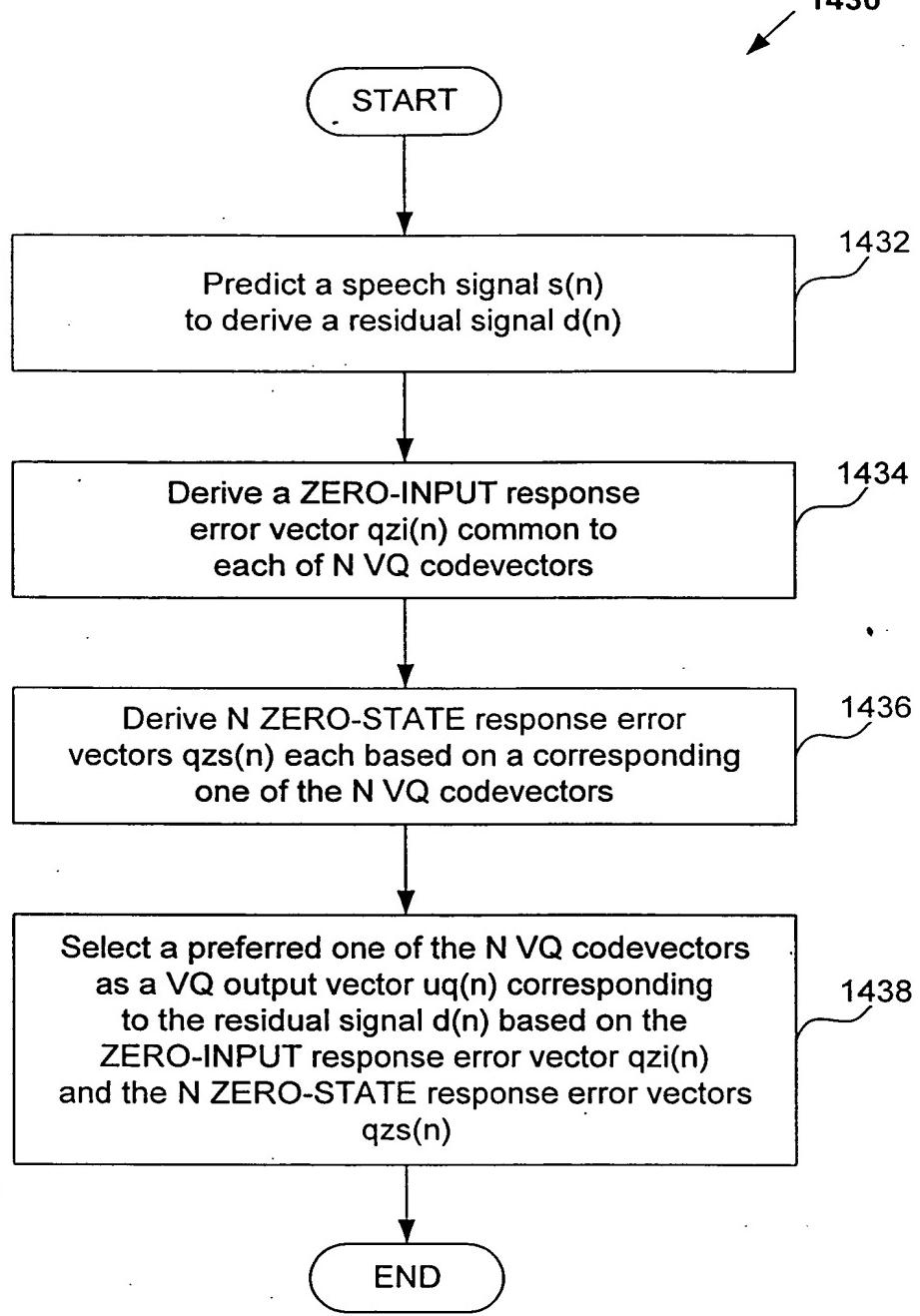
**FIG. 13D**



**FIG. 13E**

**FIG. 14A**

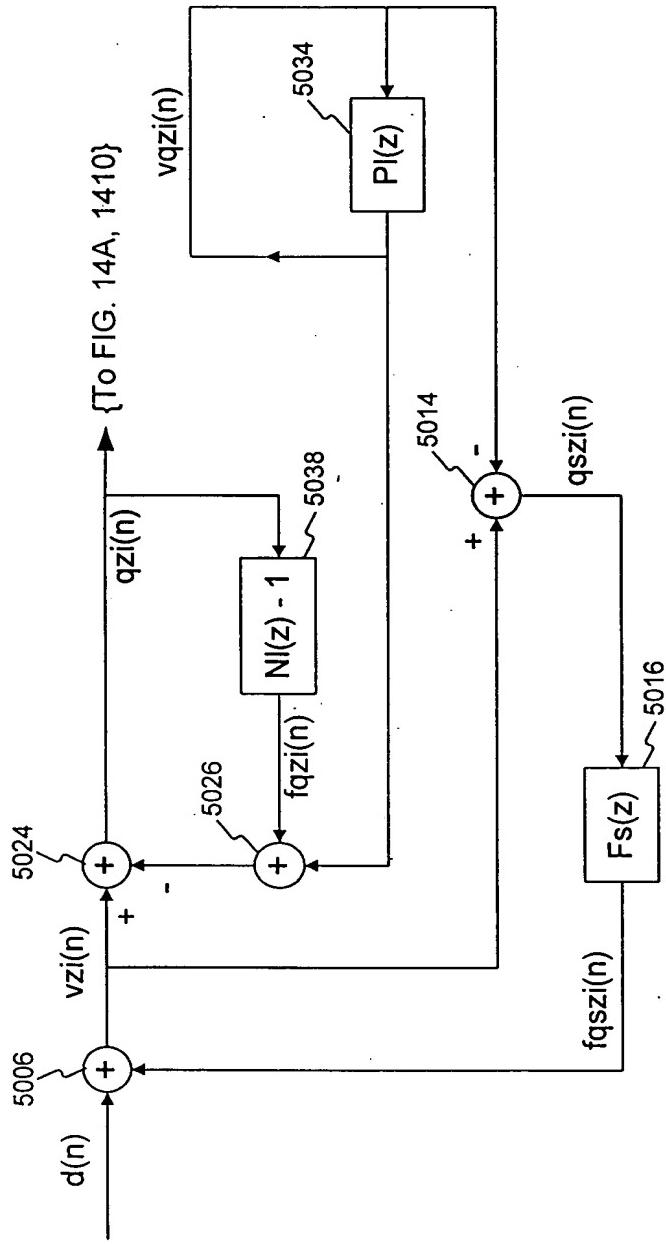




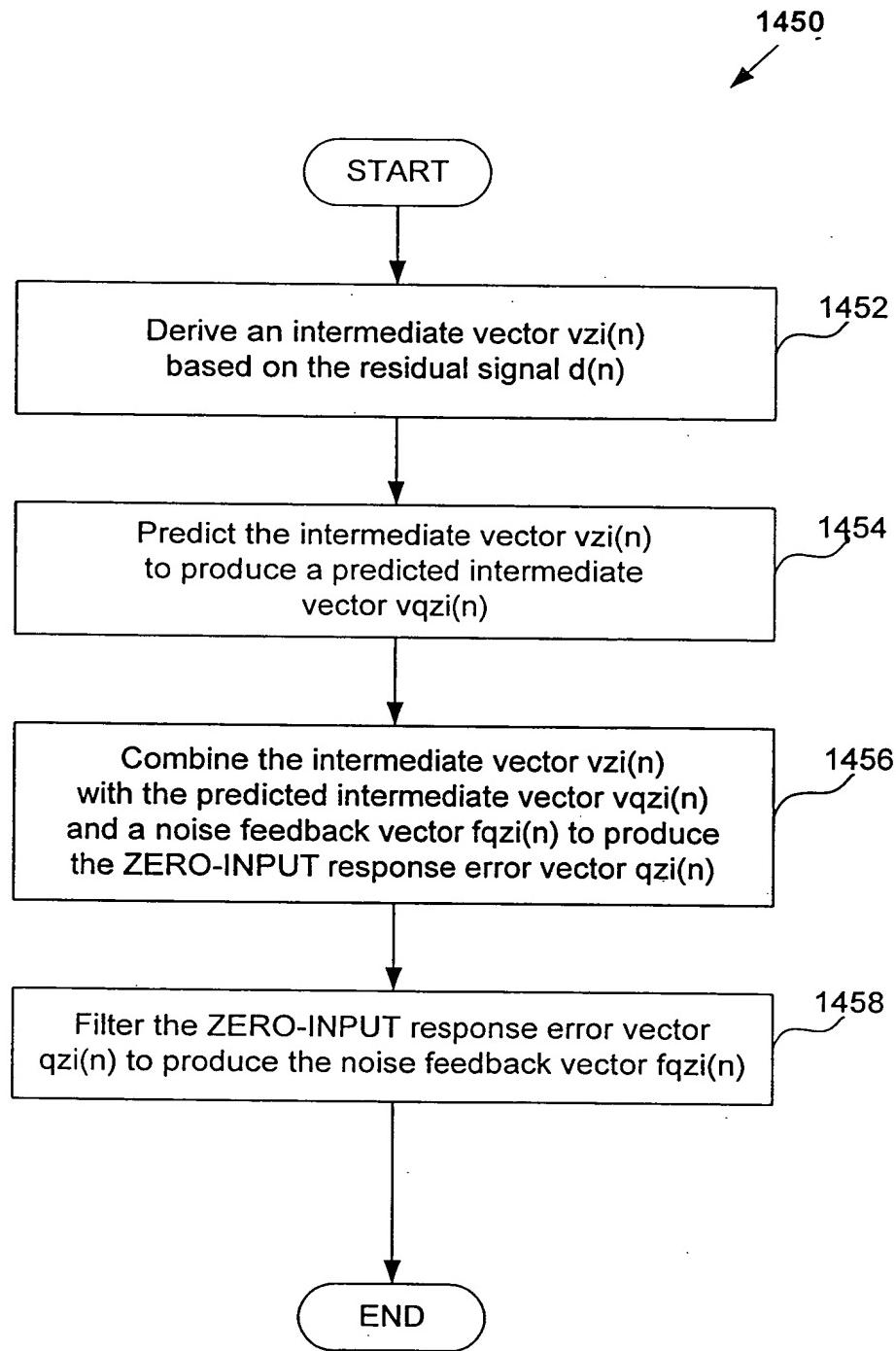
**FIG. 14B**

**FIG. 14C**

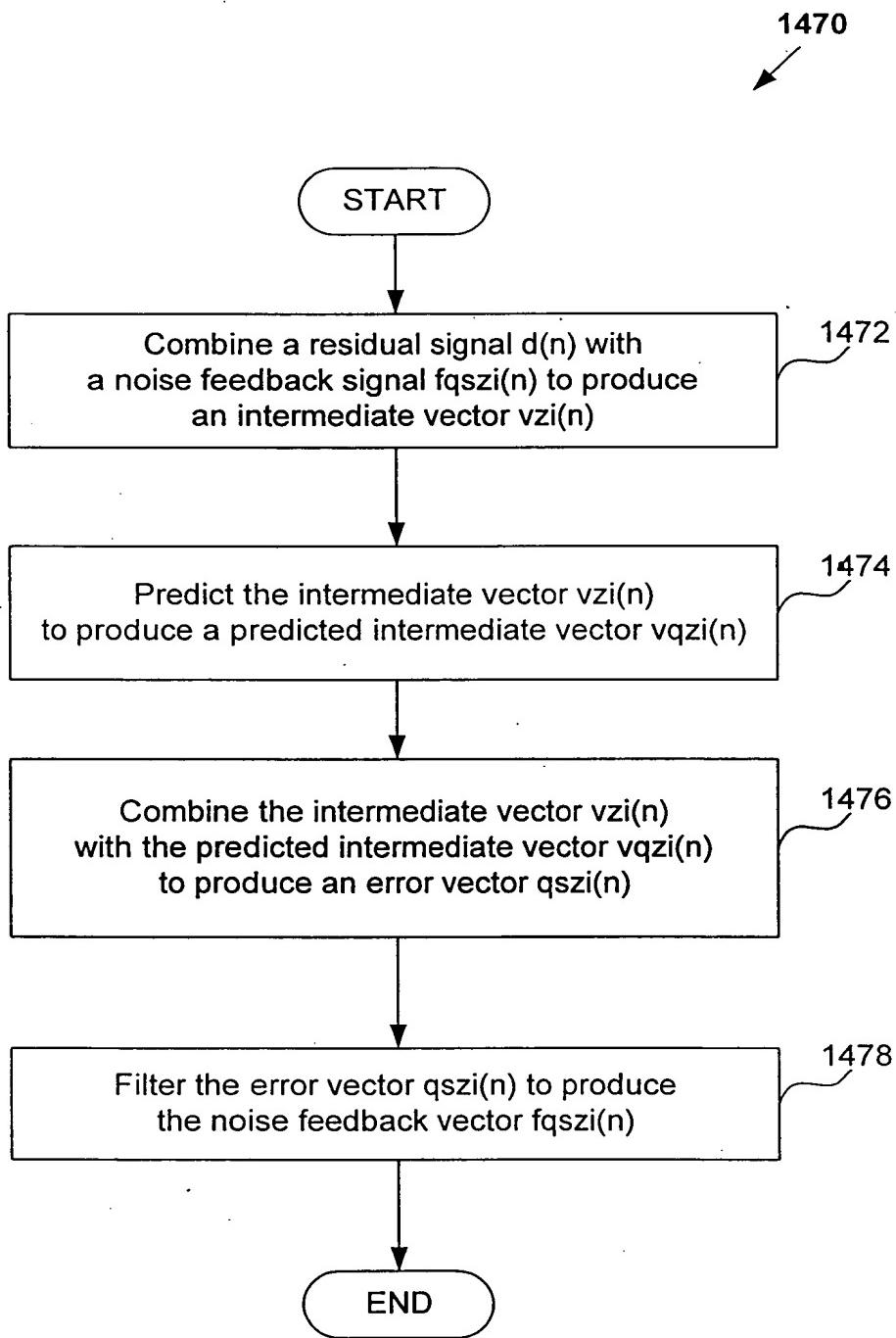
1402a



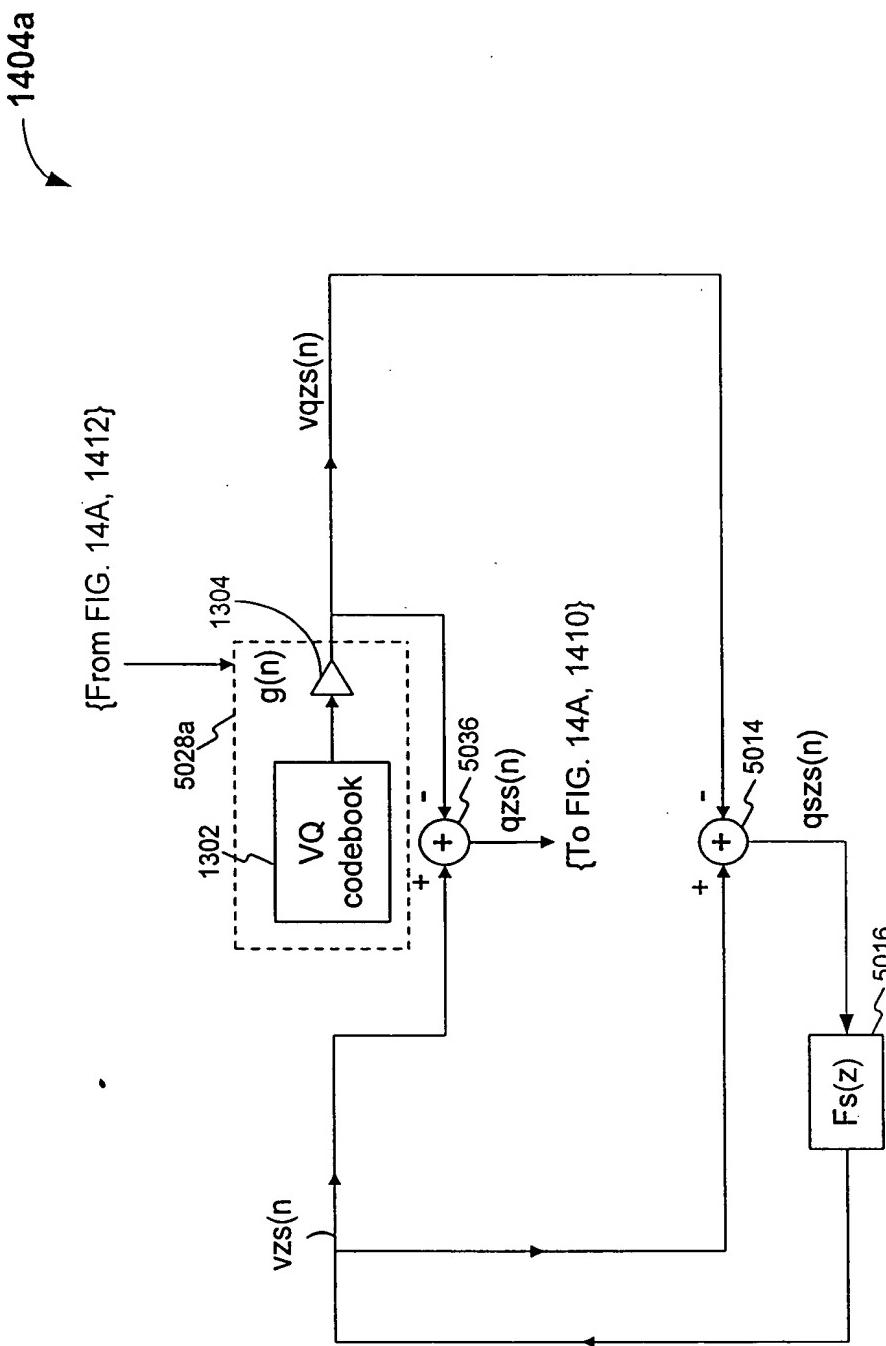
Filter structure during the calculation of the zero-input response of  $q(n)$  of Fig. 13C.



**FIG. 14D**



**FIG. 14E**

**FIG. 15A**

Filter structure during the calculation of the zero-state response of  $q(n)$  in Fig. 13C.

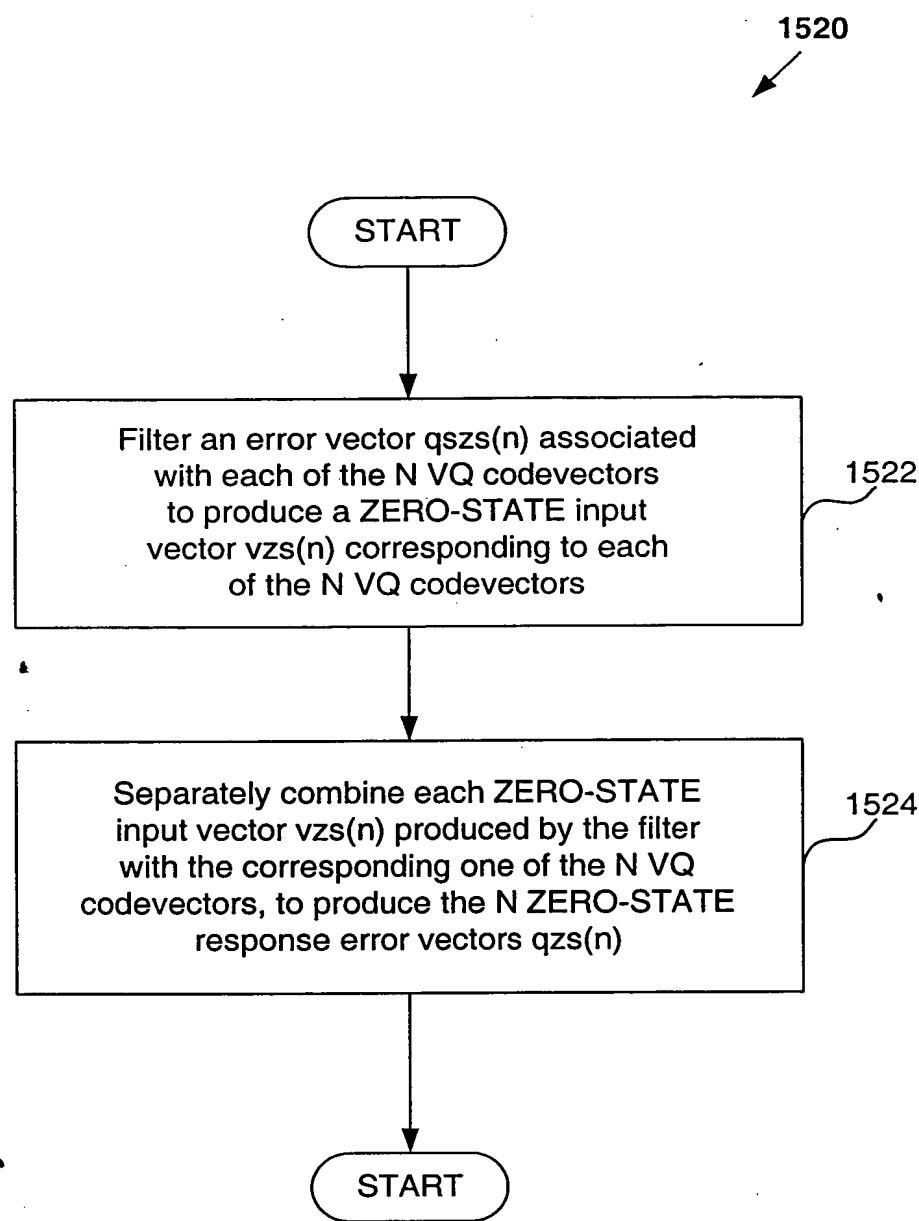
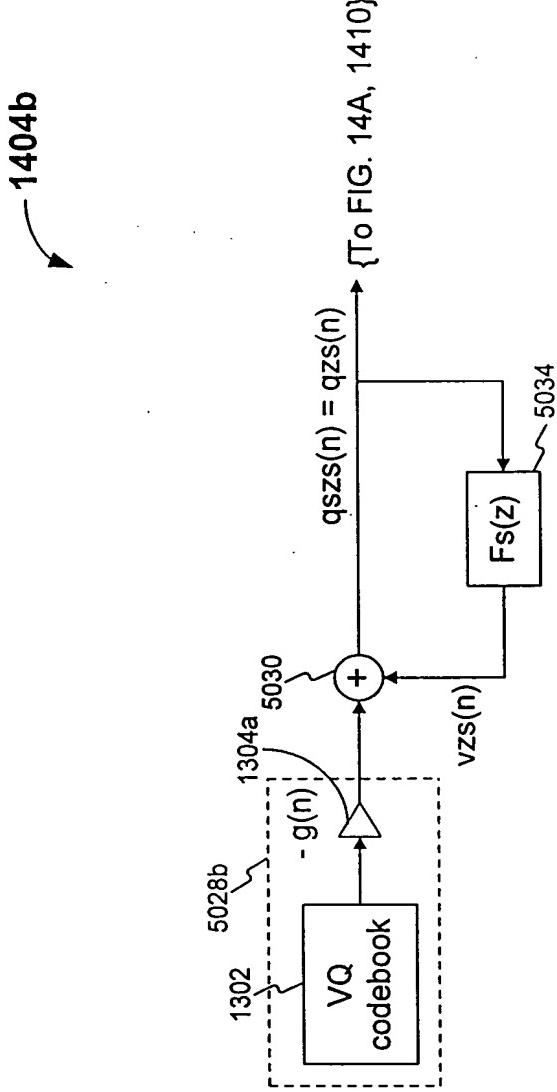


FIG. 15B



A filter structure equivalent to the structure in Fig. 15A.

**FIG. 16A**

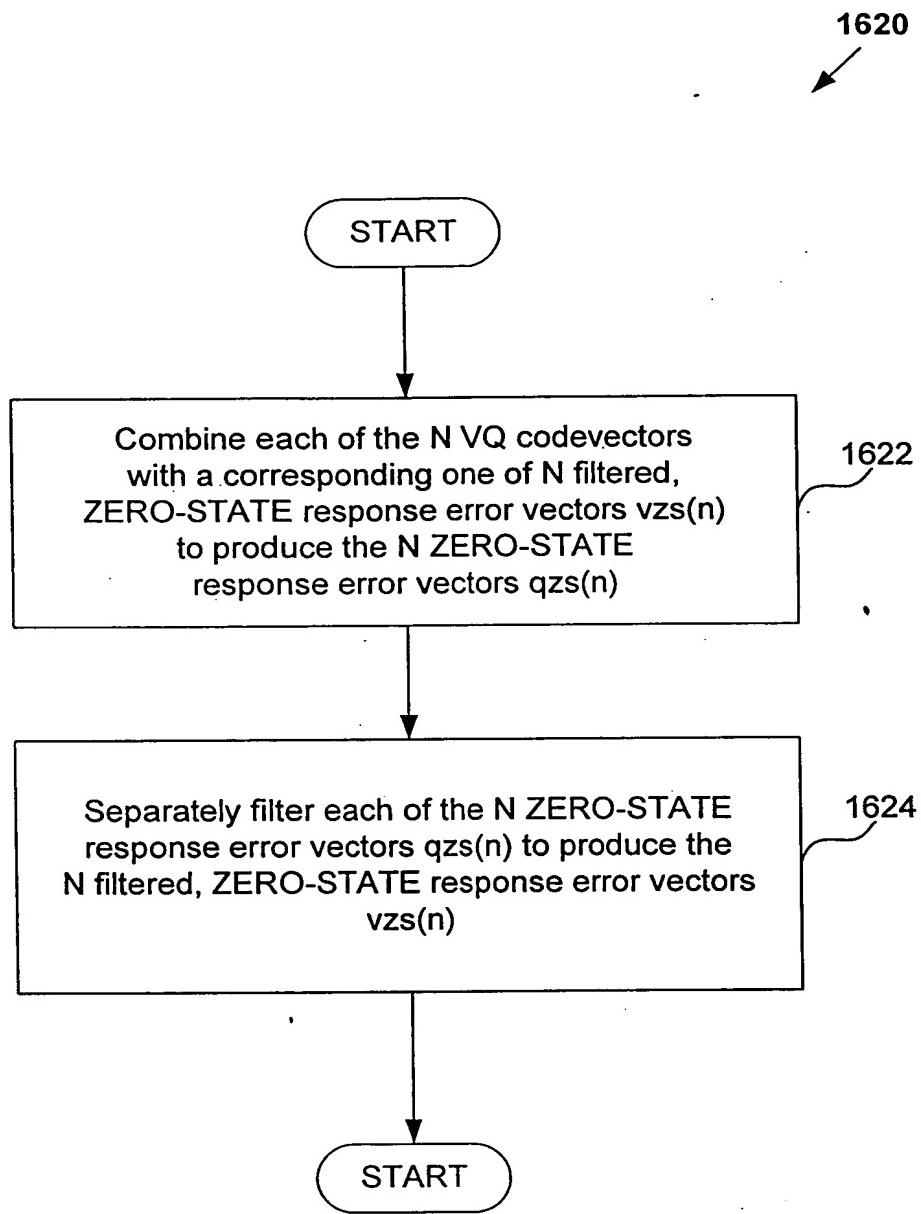
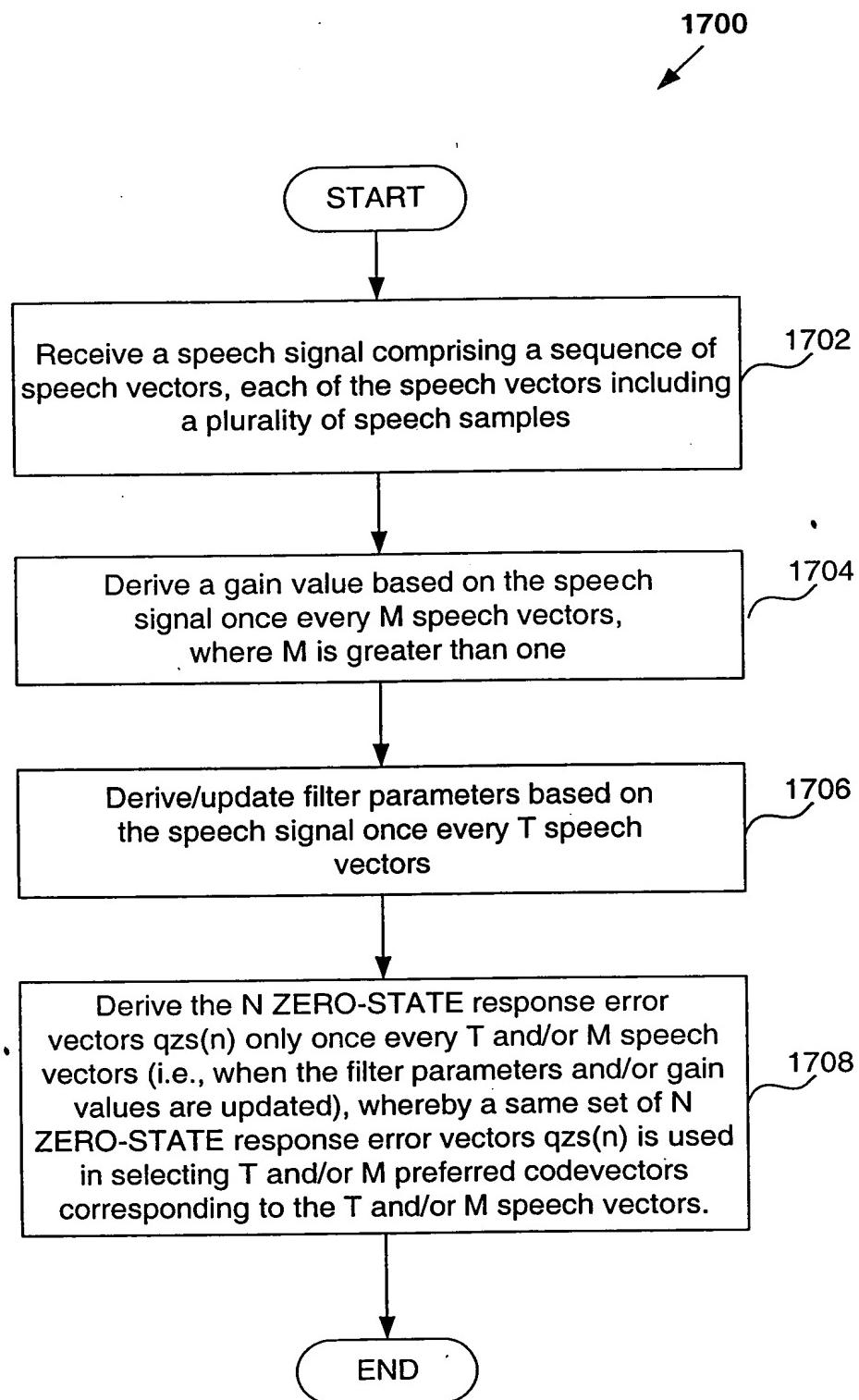
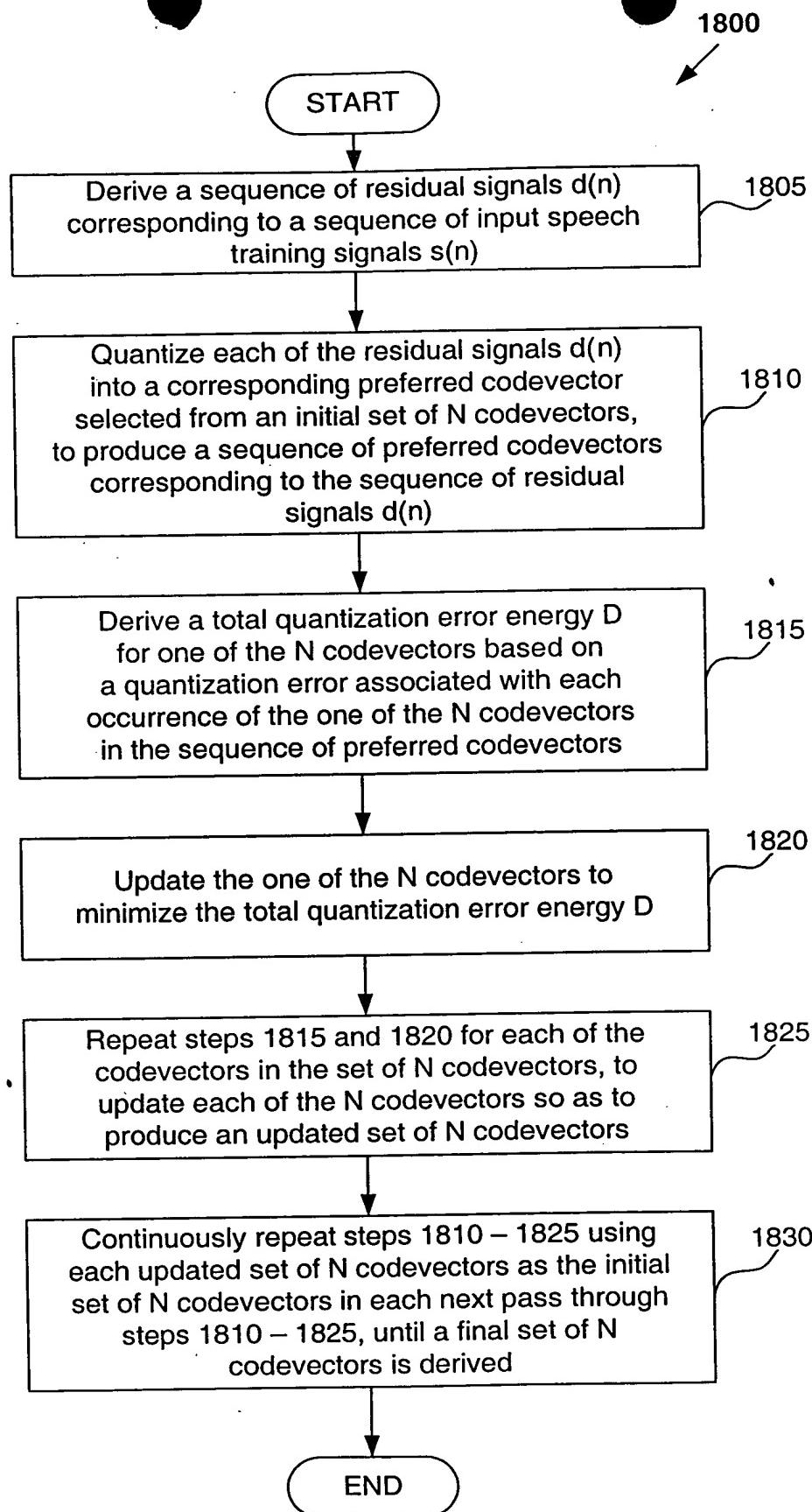


FIG. 16B

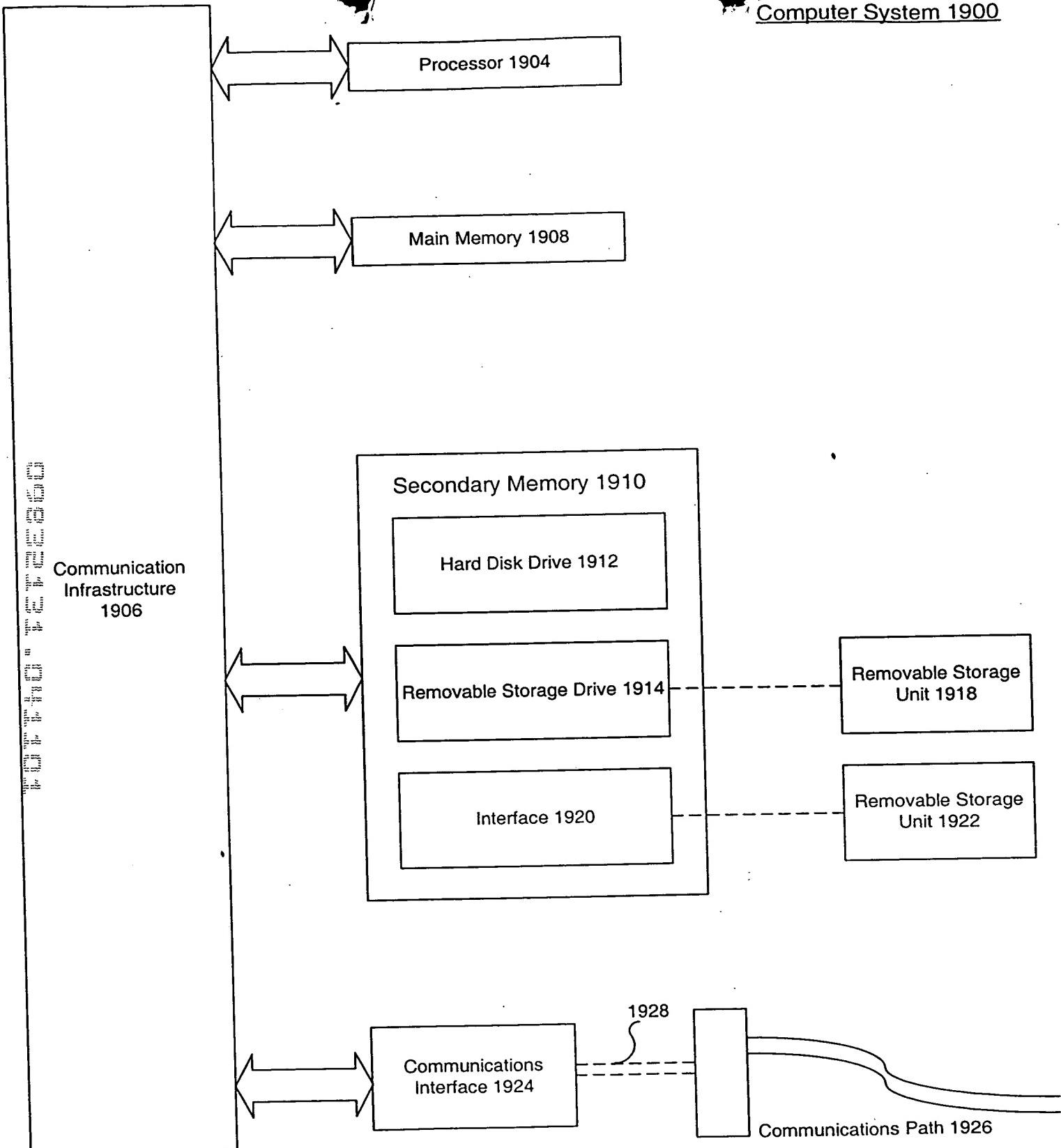


**FIG. 17**

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**FIG. 18**



**FIG. 19**